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2. A Treatise on the Diseases of the Air-Passages; comprising an Inquiry into the History, Pathology, Causes, and Treatment of those affections of the Throat called Bronchitis, Chronic Laryngitis, Clergyman's Sore-Throat, &c. By Horace Green, A. M., M. D.
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Communications have been received from Mr DUNCAN, Mr ANDERSON, and Mr BENSON.

The following Publications have been received:—

Clinical Lectures on the Practice of Medicine. By Robert Graves, M. D., M. R. I. A., &c., formerly Physician to the Meath Hospital and County of Dublin Infirmary, &c. &c. Second Edition. Edited by J. Moore Neligan, M. D., M. R. I. A., &c. In two volumes, 8vo. Vol. i. pp. 586. Vol. ii. pp. 570. Dublin, London, Edinburgh, 1848.

Lectures on the Diseases of Infancy and Childhood. By Charles West, M. D., F. R. C. P., Senior Physician to the Royal Infirmary for Children, Physician-Accoucheur to the Middlesex Hospital, and Lecturer on Midwifery at St Bartholomew's Hospital. London, 1848. 8vo. Pp. 488.

Guy's Hospital Reports. Second Series. Vol. vi. Part 1. October, 1848. Edited by George Hilaro Barlow, M. A., M. D., Cantab., F. R. C. Physicians; Edward Cock, F. R. C. Surgeons, and Assistant-Surgeon to Guy's Hospital; Edmund Lloyd Birkett, M. D., Cantab., F. R. C. Physicians; and Alfred Poland, F. R. C. S., &c. London, 1848. 8vo. Pp. 196.

Hand-Book of Physiology. By William Senhouse Kirkes, M. D., assisted by James Paget, Lecturer on General Anatomy and Physiology at St Bartholomew's Hospital. With Illustrations on Steel and Wood. London, 1848. Post 8vo. Pp. 706.

The Diagnosis and Treatment of Eruptive Diseases of the Scalp. By J. Moore Neligan, M. D., M. R. I. A., &c. Dublin, 1848. 12mo. Pp. 55.

On Femoral Rupture; its Anatomy, Pathology, and Surgery; with a New Mode of Operating, applicable to cases of Strangulated Herniæ generally. With Plates. By John Gay, F. R. C. S. E., S. to the R. Free Hospital, F. of the R. M. C. Society, &c. &c. London, 1848. 4to. Pp. 97.

Clinical Midwifery; comprising the Histories of Five Hundred and Forty-five Cases of Difficult, Preternatural, and Complicated Labour. With Commentaries. By Robert Lee, M. D., F. R. S., F. R. C. Physicians, London, &c. Second Edition. London, 1848. 12mo. Pp. 228.

The Influenza, or Epidemic Catarrhal Fever of 1847, 1848. By Thomas Bevill Peacock, M.D., Lic. of the R. C. Physicians, &c. London, 1848. 8vo. Pp. 132.

Physiological, Anatomical, and Pathological Researches. By John Reid, M.D., F.R.C.P.E.; Chandos Professor of Anatomy and Medicine in the University of St Andrews, &c. &c. Edinburgh, 1848. 8vo. Pp. 659.

Clinical Lectures, delivered in the Theatre of Mercer's Hospital during the Session of 1847-48. By James F. Duncan, M.D., T.C.D., Assistant Physician to the Hospital, F. K. and Q.'s College of Physicians, &c. Dublin, 1849. 8vo. Pp. 122.

Observations upon Bulam, Vomito-Negro, or Yellow Fever; with a Review of a Report upon the Diseases of the African Coast, by Sir William Burnett and Dr Bryson, proving its highly contagious powers. By Sir William Pym, K.C.H. London, 1848. Post 8vo. Pp. 311.

On the Treatment of Ulcers on the Leg without Confinement. By Henry T. Chapman, F.R.C.S., &c. &c. London, 1848. Post 8vo. Pp. 156.

A Treatise on the Cure of Ulcers by Fumigation: In which a Rational Treatment is deduced from the Physiology of Ulceration, &c. &c. By George Alfred Walker, Surgeon, &c. &c. London, 1847. 8vo. Pp. 112.

A Treatise on the Diseases of the Heart and Great Vessels; and on the Affections which may be mistaken for them. By J. Hope, M.D., F.R.S., &c. Fourth Edition. London, 1849. 12mo. Pp. 609.

Medical Jurisprudence. By Alfred S. Taylor, F.R.C.S., L.R.C. of P., M.R.C.S., and Professor of Medical Jurisprudence and Chemistry in Guy's Hospital. Third Edition. London, 1849. 12mo. Pp. 849.

Memoranda on Poisons. By T. H. Tanner, M.D., &c. London, 1848. 32mo. Pp. 63.

Hints towards the Formation of a more Comprehensive Theory of Life. By S. T. Coleridge. Edited by Seth B. Watson, M.D. of St John's College, and formerly one of the Physicians to the Hospital at Oxford. London, 1848. Post 8vo. Pp. 94.

Observations on the Pathology of Croup: With Remarks on its Treatment by Topical Medications. By Horace Green, A.M., M.D., &c. &c. New York and London, 1849. 12mo. Pp. 115.

A Treatise on Cholera, containing the Author's Experience of the Epidemic known by that Name, as it prevailed in the City of Moscow in Autumn 1830 and Winter 1831. By James Keir, M.D., Professor of Pathology, Therapeutics, and Clinical Medicine in the Imperial Academy of Medicine and Surgery, &c. &c. Edin. and Lond., 1832. 8vo. Pp. 138.

Practical Observations on the Prevailing Epidemic called Cholera; with Advice to the Heads of Families and others. By James Keir, M.D., K.N.T., Ex-Professor, &c. Moscow, &c. Part 1. 1848. 8vo. Pp. 28.

Some New Views respecting Asiatic Cholera. By Arthur Leared, A.B., M.B. London and Dublin, 1848. 8vo. Pp. 50.

Diet and Cholera; showing the Vital Importance of Wholesome Diet, &c. &c. By William Barnard Boddy, Surgeon, late Medical Superintendent of the Cholera Hospital. London, 1848. Pp. 40.

Observations on Asiatic Cholera, during a Residence at St Petersburg, in 1848; and on its Prevention and Cure, &c. By Adair Crawford, M.D., M.R.C. Physicians, London. London, 1848. 8vo. Pp. 24.

Remarks on Chloroform in Alleviating Human Suffering, showing that there is no Scriptural authority to interdict its Administration. By W. H. Bambrigge, Esq., F.R.C.S.L., &c. &c. London, 1848. Pp. 43.

Pathologia Indica; or the Anatomy of Indian Diseases, based upon Morbid Specimens from all parts of the Indian Empire, in the Museum of the Calcutta Medical College: Illustrated by Detached Cases, &c. &c. By Allan Webb, B.M.S., Professor of Descriptive and Surgical Anatomy in the Calcutta Medical College. &c. Second Edition. In two Parts. Calcutta, 1848. 8vo. Pp. 400.

The Serpentine as it is and as it ought to be; and the Board of Health as it is and as it ought to be. By Edward John Tilt, M. D., &c. London, 1848. 8vo. Pp. 67.

State of the Lincoln Lunatic Asylum. 1848. Lincoln. 8vo. Pp. 53.

A Practical Treatise on the Use of the Microscope, including the different methods of Preparing and Examining Animal, Vegetable, and Mineral Structures. By John Quekett, Assistant-Conservator of the Museum and Demonstrator of Minute Anatomy at the Royal College of Surgeons of England, illustrated with nine Plates and two hundred and forty-one Wood Engravings. London, 1848. 8vo. Pp. 464.

Outlines of Physiology, for the Use of Students. Part 2. By Allen Thomson, M.D., F. R. S. L. & E., Professor of Anatomy in the University of Glasgow. Pp. 181–308. Post 8vo. Edinburgh, 1848.

A Practical Treatise on the Domestic Management and most important Diseases of Advanced Life; with a new and successful mode of treating Chronic Rheumatism, &c. By G. George E. Day, M. D., F. R. C. Physicians, &c. London, 1849. 8vo. Pp. 342.

The Microscopic Anatomy of the Human Body in Health and Disease. By Arthur Hill Hassall. Part 14. September. London, 1848.

Wonders Displayed in the Human Body, in its Endurance of Injury. From the Portfolio of Delta. London, 1848. 8vo. Pp. 39.

A Critical Treatise on the General Paralysis of the Insane. By James M. Winn, M. D., Physician to the Royal Cornwall Infirmary, &c. London, 1848. 8vo. Pp. 50.

Account of a Case of Disease of the Appendix Cæci cured by Operation, &c. By Henry Hancock, F. R. S. C. E., &c. Lond. 1848. 8vo. Pp. 12.

Elements of Anatomy. By Jones Quain, M.D. Fifth Edition. Edited by Richard Quain, F.R.S., and William Sharpey, M.D., F.R.S., In two vols. Part iii., completing the work. Pp. 879—1363. Lond. 1848.

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The British and Foreign Medico-Chirurgical Review, or Quarterly Journal of Practical Medicine and Surgery. No. 4. October 1848. 8vo. London.

The Dublin Quarterly Journal of Medical Science. New Series. No. 12. November 1848. Dublin, 1848.

Weekly Tables of Mortality for the Metropolis. No. 37, 16th September 1848. No. 49, 9th December 1848. Annual Series, ix.

The Ethnological Journal, No. 5, October 1, 1848—No. 7, December 1, 1848.

The Charleston Medical Journal and Review, (late Southern Journal of Medicine and Pharmacy.) Edited by P. C. Guillard, M.D., and H. W. De Saussure, M.D. Vol. iii. July 1848. No. 4. Bimonthly. Charleston, 1848.

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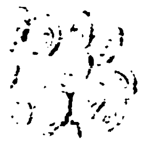

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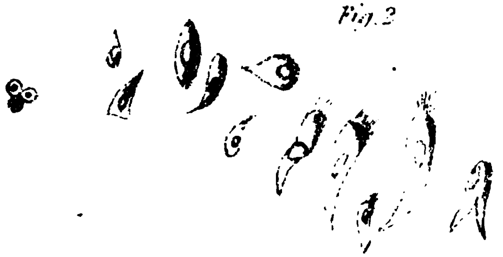

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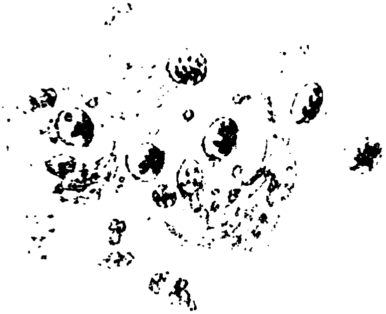

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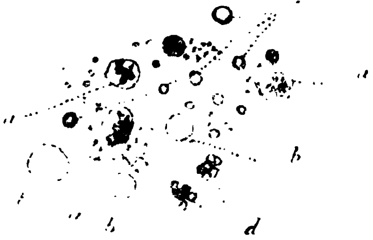

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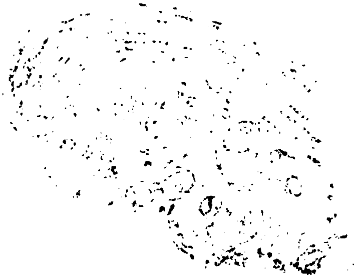

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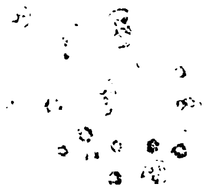

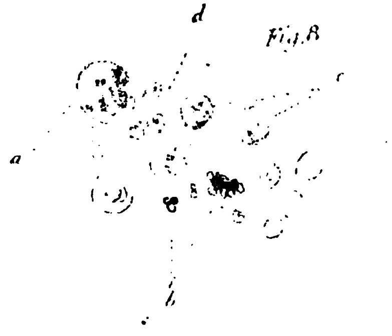

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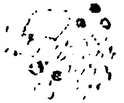

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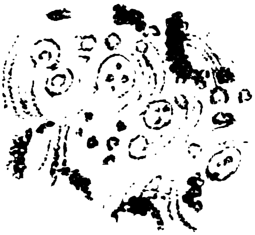

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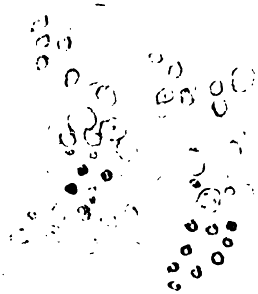

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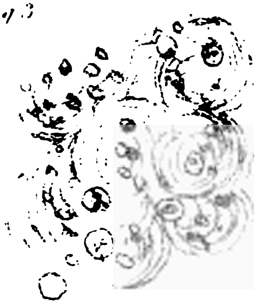

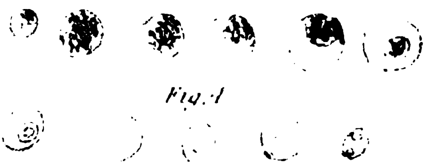

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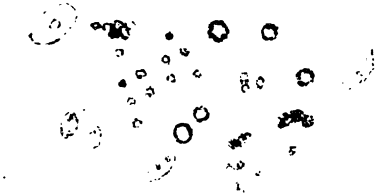

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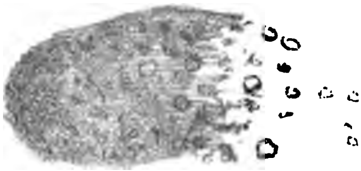

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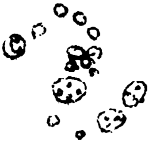

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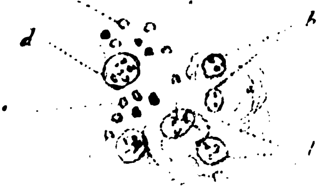

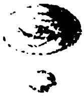

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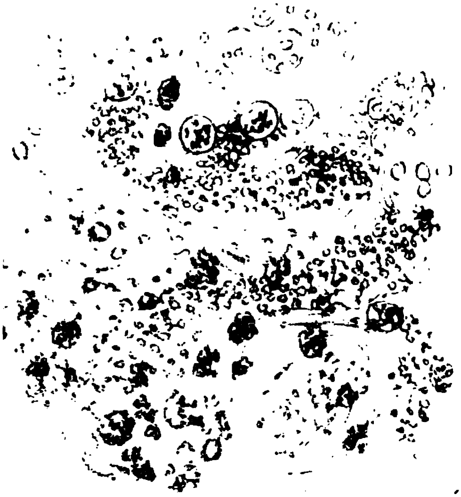

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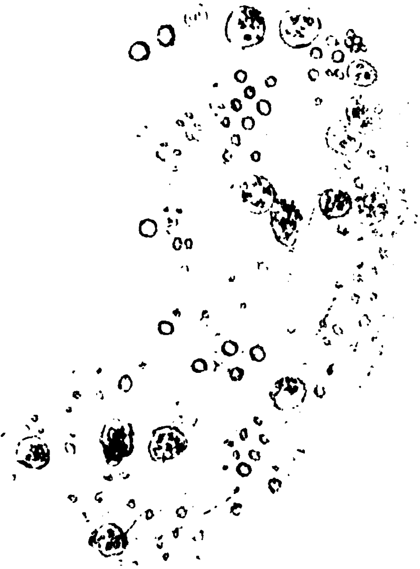

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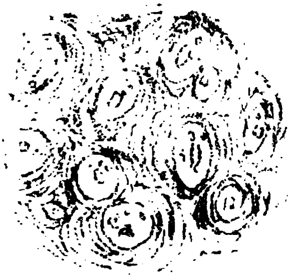

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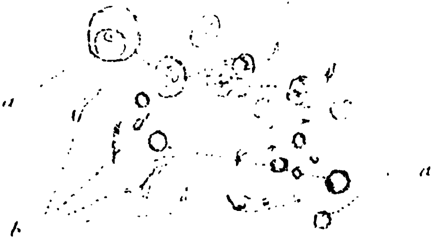


Fig. 5

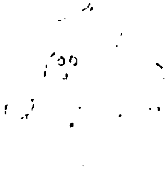
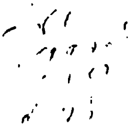


Fig. 6



THE

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PART I.

ORIGINAL COMMUNICATIONS.

Art. I.—*Cases and Observations illustrating Inflammatory Effusions into the Substance of the Lungs, particularly as modified by Contagious Fevers.*[*] By William Aitken, M. D., Surgeon, and Demonstrator of Anatomy in the University of Glasgow.

In the following pages I purpose to direct the attention of the medical profession to some pathological conditions of the lungs which do not appear to have been previously observed with sufficient care. The morbid changes referred to consist in the exudation of *liquor sanguinis* from the minute blood-vessels—a phenomenon in regard to which the views of pathologists are still somewhat vague, whether it occurs as a general morbid change, or in those particular forms to which it is my intention at present to advert; for it must be admitted that they are as yet very imperfectly acquainted with the minute anatomical relations of the exuded matter, the circumstances under which it is generated, and the conditions which tend to modify the changes which the new substances undergo subsequent to their exudation.

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[*] The above communication formed the substance of An Inaugural Dissertation presented to the Faculty of Medicine by the author on his graduation at the University of Edinburgh in 1848, and for which one of the gold medals was awarded to him by the Senatus Academicus.

My remarks upon this subject will be illustrated by a series of cases which lately came under my observation in the Royal Infirmary of Edinburgh, in the description of which it will be my object principally to direct the attention of the reader to the manner in which the exuded matter may be traced into the minutest parts of the pulmonary texture; the circumstances modifying the elementary forms which the exuded *liquor sanguinis* may assume during its organization; and the different stages of progression by which this morbid affection may terminate in resolution, in permanent organic mischief, or in death.

In the examination of a lung not presenting all the appearances of health, it is impossible to ascertain with the unaided eye whether or not the morbid degeneration it may have undergone is of the nature of exudation; and still less to determine the nature of the exuded matter without the employment of the microscope.

In the lung, as in every other organ of the body subject to the exudation of *liquor sanguinis*, the matter resulting from the exudation is liable to various modifications, according to the structure of the part affected.

The question then presents itself at the outset of this inquiry; Under what circumstances is a lesion in the substance of the lung to be regarded as an exudation resulting from inflammatory action? Such a lesion will be found to exist when an exudation of *liquor sanguinis* has taken place and becomes organized in various forms; and it is my object to describe some of the conditions which appear to modify the forms of organization assumed by this exuded matter.

The coagulated matter of exudation exhibits in the pulmonary substance a general tendency to become organized, and it is only under more rare circumstances that it tends to undergo rapid disintegration or décomposition, and to involve the substance of the lung itself in death. Like other morbid processes, the organization of the exuded matter will be most conveniently considered with reference to its several stages; which have been well determined by Laennec. In the first stage, no exudation takes place; but the excess of blood in the part is followed by a serous effusion, and a decrease in the firmness of the parenchyma. This condition of hyperæmia appears to exist occasionally, under three circumstances. It may exist, (1) as the invariable condition of a part in which exudation of *liquor sanguinis* is about to take place; (2) as the result of deficient nervous energy, and the consequence of gravitation; (3) in the phenomena of blushing, and the vascularity of erectile tissues. A question here suggests itself, namely, "Is it possible to distinguish congestion in a part about to be the seat of an exudation of *liquor sanguinis*, from those other congestions which are stated to exist?" Almost every author maintains that there is no ground of distinction sufficiently well-marked between the engorgement of inflammation in its first stage, and those congestions which I have specified. Andral considers the anatomical characters of hyperæmia as the same in all cases, so that the nature of the lesion found on dissection is only to be judged of according to the nature of the symptoms during life,[*] an opinion in which Bouillaud[†] and Williams[‡] coincide. Chomel,[§] however, attaches more importance to the morbid appearances after death, and grounds his opinion as to the existence or non-existence of inflammation on the presence of softening in the texture of the lung, considering friability of the lung a sufficient ground of distinction between inflammation and congestion. But there are cases of disease in which conditions of the lung are observed presenting all the morbid appearance of inflammation to the naked eye at least, and to the other organs of the senses, so far as consolidation, non-crepitation, and friability are concerned; and in which during life neither physical signs nor constitutional symptoms indicate any departure from the normal condition; from which it appears that it may be difficult, if not impossible, to distinguish whether the appearances presenting themselves after death, depend simply on congestion, on effused blood, or on mucous and purulent formation. This is more particularly the case in that condition of the lung described as hæmorrhagic hepatization, " the pneumonia of the dying," a condition which frequently follows surgical operations, and where death takes place by way of asthenia. In hæmorrhagic hepatization, there is no organized exudation of blood-plasma, there is merely congestion and effusion of blood, which may undergo those changes to which effused blood is subject. The existence of friability along with the congested appearance is not conclusive, although it adds to the probability of the existence of exudation. Friability of all the textures is a constant consequence of typhus fever, when no exudation into organs has taken place, as well as of recent organized products of exudation from the blood-vessels in any part, and under any conditions. Again, a lung may be consolidated from distension of the air-tubes and pulmonary vesicles by the epithelium secreted from their lining membrane. In the lungs of cattle that have died from pulmonary disease, I have seen the air-tubes filled by a secretion from their lining membrane, extending into their most minute ramifications, and so tough, firm, and elastic, that it was perfectly moulded to the calibre of the bronchia, and could be drawn out, preserving a cast of the tube and its ramifications.

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[*] Pathological Anatom. Trans. vol. xi. p. 509.
[†] Dict. de Med. et de Chirurgie Pratiques, t. xiii. p. 36.
[‡] Cyclop. of Prac. Med., vol. iii. p. 409.
[§] Dict. de Med. et Chirurgie Pratiques, tom. xvii.

Such a condition rendered the lung perfectly dense, independently of any exudation from its blood-vessels into its substance. These are circumstances which lead to fallacy in determining the nature of the lesion affecting the lung; and it must be of importance if microscopic observation, or any other mode of research, shall be found sufficient to establish a difference between condensation from inflammatory, and that from non-inflammatory congestion. The difference, however, has not yet been discovered; and if ever it shall be, its more early distinctive features may be sought for in a change of the blood itself.

In reviewing the various theories of inflammation, and the changes which are described to take place in the blood, it is impossible to avoid entertaining the notion that a peculiar dyscrasia exists, which is at once the cause of the constitutional disturbance, the local lesion, and the particular form in which the exudation from the blood-vessels may become organized. This dyscrasia may consist either in the blood containing a morbid material, or in its normal constitution being changed. The coalescing of the blood-corpuscles, and the formation of a buffy coat, have long been supposed to be appearances especially connected with an inflammatory state.

To this dyscrasia Piorry has given the name of "hæmatitis." It has also been shown by Andral and Gavarret, that, during inflammation, an excess of fibrin exists in the blood, and that the proportion is not only increased relatively to the blood-globules and other constituents, but also in proportion to the whole amount of this fluid in the body. It is farther supposed that the blood is more inclined to adhere to the surrounding parts, from the appearances presented in the vessels, and from the fact of the corpuscles also possessing this property in regard to each other; a phenomenon which some have conceived to depend upon a change in the relations of the attractive forces of an organic kind or others, subsisting between the several component parts of the blood and the surrounding textures. So much indeed is the healthy constitution of the blood affected during the existence of several acute diseases, that some are inclined to consider acute rheumatism, chorea,* and pericarditis,† to be dependent on a morbid condition of the blood. From all these circumstances I feel convinced, and it is my object in this paper to show, that during the progress of extensive exudations from the blood-vessels into any organ, a dyscrasia of the blood exists; that it is owing, in part, to the existence of some such dyscrasia that these exudations take place, the ultimate nature of whose organization may be made apparent by microscopic examination after death; and that in the series of changes which take place in a part where exudation from the blood-vessels has occurred, the forms of organization depend as much upon the nature of the particular dyscrasia which exists, as upon the stage of development at which the organization of the exuded *liquor sanguinis* has arrived at the period of examination.

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* Dr Begbie on Rheumatism and Chorea, p. 15.

† Dr Taylor on the Causes of Pericarditis, in 28th vol. of Royal Med. and Chirurg. Soc. Trans., 1845.

The cases of which I have witnessed the dissections in the Edinburgh Royal Infirmary, in which consolidation of the substance of the lung mainly contributed to cause death, or in which no other local lesion was apparent after death sufficient to account for the fatal termination, have been 101 in number, and were observed from June 10, 1847, until March 13, 1848. Many more cases of pulmonary disease during that period in the same hospital proved fatal, but only 101 could be inspected after death. The following table presents a condensed analysis of the conditions under which the pulmonary lesion existed.

The lung was more or less condensed—
in 56 cases of fever (34 of typhus, 22 of fever other than typhus);
13 do. in which Bright's disease existed;
13 do. marked by a cachexia, indicated by habitual bad health, various local lesions, and attended by intemperance;
6 do. of fatty heart, hypertrophy, and softening of texture;
4 do. of tuberculosis;
2 do. of secondary deposits;
2 do. of variola and rubeola;
2 do. with no other apparent lesion;
2 do. where disease extended from neighbouring parts;
1 do. with softening of *corpus striatum.*
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101

Of these 101 cases of pulmonary condensation, 56 occurred during the progress of fever. Of these 56 cases, 34 occurred during the progress of typhus and 22 during the course of fever other than typhus, such as continued fever or synocha.

In ten of the cases where the condensation occurred during the progress of typhus fever, the lung was the only organ affected. In the remaining twenty-four, other organs besides the lung appeared to have been the seat of exudation from the blood-vessels. In twelve cases the spleen was affected, in seven the pleura, in five the intestines, in four the liver, in three the pericardium; in two the heart was soft and flabby to a marked degree; in one there was gangrene of the toes; and in one there was softening of the corpus striatum; and in this latter case, the lung was in a state of gangrene; in one there was extensive ulceration of the tonsils, larynx, and glottis, requiring the operation of tracheotomy. Next to the lung, therefore, which was more or less condensed in all of these cases, the spleen seems to have suffered most frequently during the progress of fever, and the other organs in the order in which I have enumerated them.

Of the 101 cases, thirteen had Bright's disease of the kidneys, and exudations into other organs besides the lungs; thirteen were marked by a cachectic state of the body; six suffered from heart disease; four had tuberculosis; two were the subjects of secondary deposits after operations; two of variola and rubeola; and in two the exudation extended by continuity or contiguity of tissue; in one case there was softening of the corpus striatum; and in two cases there was no exudation except what was found existing in the lung.

The extensive prevalence of the lesions throughout the body is the most important feature brought out by such an analysis,—a feature sufficient of itself to maintain the probability that no immediate exciting cause can account for such extensive exudation into the most vital and important of the internal organs. In every case it might be possible to point out the existence of a pathological condition sufficient to indicate a state of the constitution capable of exercising an influence over the development of exudation from the blood-vessels, whether in the lung or in any other organ. Between the existence of an exudation, therefore, and the presence of any morbid conditions of the body, such as typhus fever, Bright's disease, synocha, synochus, or variola, we are to recognize the existence of the same relations; for in all of these conditions we have circumstantial evidence of a dyscrasia in the blood.

During Bright's disease, we know that a non-elimination of urea is a constant pathological condition; that during its course there is a great liability to the exudation of *liquor sanguinis* in various internal organs—a liability proportioned in some degree to the amount of adulteration which an imperfect action of the kidneys causes in the blood; and that these internal exudations of *liquor sanguinis* can be justly referred to the condition of the blood alone.

During the progress of typhus fever, it is known that there is also a great liability to exudation from the blood-vessels of various organs, more especially in the lungs, spleen, pleuræ, intestines, liver, and pericardium; that the occurrence of these exudations bears no proportion to the apparent severity of the fever; for, frequently, cases of intestinal lesions, as well as lesions of the lungs or spleen, are discovered after death, when no knowledge of their presence could have been obtained from symptoms existing during life; that no immediately exciting cause can account for the exudation; and, lastly, that the number of parts affected, shows the universal nature of the cause. By considering a dyscrasia of the blood to be a cause, at once of the typhus fever and of the exudation, we are enabled to explain the occurrence of a series of symptoms, by such a theory, if they are not found associated either with the epileptic constitution, or with delirium tremens. I refer to the occurrence of convulsions, which almost invariably prove fatal, of which I have given the records of six cases occurring in the Infirmary during the month of February 1848. (See Monthly Journal of Medical Science for June 1848.)

There can, perhaps, be no better illustration brought forward of the association of exudation from the blood-vessels with a vitiated condition of the blood, than that which is afforded by the exudations occurring during the course of exanthematous diseases. In the condition of scarlatina we have an exudation in the throat, of which the fauces seem to be especially susceptible. In rubeola the lungs seem to be the most frequent seat of exudation; in variola the skin and the intestinal canal. These facts show that, where such exudations into external organs accompany such diseases, where a morbid condition of the blood evidently exists, the exudations must be ascribed in part to that universal and constitutional cause. The cases of secondary deposits, as well as of tuberculosis, in which an unnatural state of the blood exists, bear the most direct testimony in favour of this view. The character and amount of organization which the exuded matter attains must, therefore, also be examined in relation to the morbid condition of the blood; and I hope to be able to show that, as the blood departs from the healthy standard, so does the character of the exudation change; for the morbid state of the blood is to be regarded as the cause of the peculiarities in the inflammatory products. Again, if we look to the immediately-exciting causes of the exudation into the lung, we shall find that they are usually described as those which are also the immediately-exciting cause of Bright's disease, of typhus fever, of synocha, or of synochus. Inadequate clothing, cold, wet, or intemperance have been looked upon as the common cause of all; but how frequently do exposures to all vicissitudes fail in inducing disease, until a change not usually perceived predisposes the individual to morbific agencies? The change is a gradual one, commencing in the fluids of the body, and brought about under a combination of circumstances, which renders the individual no longer able to resist the influence of morbid causes. No two individuals being constituted alike, either in mind or body, the relation of any individual to the atmosphere and its changes cannot be precisely the same, at any given time. The operation of similar causes, therefore, must exercise different effects upon all; and therefore it is found, that at certain periods a combination of circumstances occurs in one or in a number of individuals, arising from causes which have always been in operation, which combination of circumstances is different from all other combinations of circumstances which have existed at any period in the life of the individual, or history of the species. In the condition of the individual, and his relation to the surrounding elements in which he lives, are to be found those agencies, or that agency, which gives rise to a distemper of a new and unknown form. Thus far the disease is new, the agency or agencies new, unknown, and it may be invisible, because the combination of circumstances are novel, but the causes which brought about the combination may have been in operation since the creation of man. The production of any epidemic disease is not due to atmospheric influences alone, nor to the morbific influences of terrestrial emanations alone, but to the combined influence of both, and the existing constitution of the individual; all thus forming a combination of circumstances always changing, and always differing from those immediately preceding.

In this manner we account for the changes which the same diseases have at various times presented in their forms; and while species of human maladies, altogether new, such as small-pox, measles, and hooping-cough, add to the nosology of medical science, diseases that formerly existed altogether disappear.

In the particular "*combination of circumstances*" we are also to find an explanation, why every one exposed to any contagion does not become affected with the disease.

In every individual those conditions which I have mentioned for the development of the disease do not exist; the relation of the individual's constitution to the surrounding elements still enabling him to resist morbific influence, such as that of contagion, or of miasmata.

The particular change in the system to which, therefore, I would ascribe the occurrence of local exudation, appears most probably to consist in a vitiated condition of the blood, from the presence of some morbid matter, or from an excess of some natural constituent. Why an exudation depending upon such a general cause should locate itself in one organ rather than in another, is a question still undetermined. The most rational explanation appears to me to bear some relation to the fact, that increased activity of function in an organ renders it more liable to exudations from the blood-vessels into its substance. The anatomical constitution of an organ also modifies, in some degree, any exudation into its texture, the tissues of which it is composed having some affinity for the morbid material in the blood, or the natural ingredient which is in excess. M. Rayer, in noticing the morbid appearances of typhus in animals, has related, that in the horse and the ass, the patches of Peyer in the intestines are the frequent seat of an exudation from the blood-vessels under typhoid conditions of the system;[*] and it is also worthy of notice, that Peyer's glands in the *herbivora* are comparatively large. In warm climates we know that the activity of function in the liver is increased; and we also know that in warm climates the liver is the most frequent seat of exudation from the blood-vessels. In females in whom unusual activity of the generative organs exists, the uterus is frequently found to be the seat of disease; and in circumstances where the functional activity of the lung is increased, we are likely to have exudations of *liquor sanguinis* into its substance.[†]

The particular form of organization which the deposit assumes, and the degree of perfection to which it attains, are also to be referred, in a great measure, to such a systemic agency as a diseased condition of the blood; and these characters will also be seen to depend more upon the nature of the constitutional evil, than upon the particular stage at which the deposit is examined. This feature will be more particularly brought out, when we contrast the pulmonary exudations in the various conditions of disease. Thus the exudations during the progress of Bright's disease, typhus fever, tuberculosis, or carcinoma, differ in respect of the amount of organization from each other, although the differences are not always so well marked as to enable us to determine, by microscopic examination merely, that any given specimen is characteristic of typhous, tubercular, or carcinomatous deposit, or exudation during Bright's disease, without also taking into consideration the circumstances under which the deposit occurred. The explanation we have now given of the general cause of the exudation we shall find to be consistent with the recorded facts of the individual cases, and also with the relative appearances presented by a minute examination of the exuded products.

I therefore look upon the morbid condition of the blood as the cause of *three* effects:—

1. Of the fever or constitutional symptoms which accompany or precede the effusion.
2. Of the exudations from the blood-vessels of the *liquor sanguinis.*
3. Of the *form and perfection of organization* which the exuded products attains.

I shall now proceed to consider the forms under which exudations from the blood-vessels of the lungs become organized.

When the first local lesion has occurred, namely, the rupture of the capillaries, accounting for the presence of blood-globules in the expectoration, as well as in the products of exudation, the more characteristic, appreciable, and unmistakable changes take place in the diseased part itself, and in its secretion. The tendency of the deposit is to pass into organisms of a particular form, —organisms depending for their characteristic appearances,—

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[*] Lancet, vol. ii. 1842-43, page 373.

[†] In animals fattening in stalls, such activity of the respiratory function is required for the proper deposition of fat, and cattle are very liable to exudation into the substance of the lungs.

1. On the nature of the morbid condition of the blood.
2. On the amount of vascularity which the affected part retains.

In other words, the characters of the new formations will be found to vary with the *quantity* and *quality* of the blood; and I am also inclined to ascribe much more influence to these two circumstances in modifying the appearances of the exudation, than I am willing to allow to the power of affinity exercised between the histological elements of the structure in which the exudation takes place, and the constituents, normal or anormal, of the blood.

When the first change in the deposit takes place, the functions of the capillary vessels are not suspended; circulation, although impeded, still goes on in the part; and while effusion of blood plasma, and extravasations of blood itself, are insinuated into every minute space, imparting a degree of solidity to the texture, a great portion of the serum is at the same time rapidly absorbed. The quantity of red blood-globules extravasated with the liquor sanguinis varies with the amount of rupture which has taken place in the capillary vessels, and on this circumstance does the redness of the exuded matter depend, as well as on the increased amount of capillary injection. "By this change the lung at first sight would seem to acquire increased hardness, and in point of fact it becomes more dense, and rapidly sinks in water. Reflection, however, will show that the term 'hardening' here is merely comparative. A lung so affected is undoubtedly harder and heavier than it was in its previously spongy, light, and healthy state, on account of the displacement of air by the solidified exudation. But if the finger be thrust into a healthy, and then into a hepatized lung, it will be found, that whilst the former offers considerable resistance, the latter is friable, and readily breaks down, proving that in point of fact a softening of the tissue has taken place."* According to authors, the specific gravity is increased as compared with the healthy lung in the proportion of 1·15 or 1·19 to 1, and the condensation throughout is generally complete, without a vestige of crepitation. The cut surface appears uniformly studded with flat granular elevations which are easily effaced. The pathology of this granulated appearance is differently accounted for by authors on pneumonia. Laennec considered the granulations to be the air-cells converted into solid grains by the thickening of their parietes, and the obliteration of their cavities by a concrete fluid.* Andral considered that pneumonia essentially consists in an inflammation of the pulmonary vesicles, the internal surface of which secretes a liquid, at first muco-sanguineous and then purulent. In proportion as the inflammation advances, the liquid secreted becomes more thick and viscid, until at length it cannot be expelled from the cavity, where it is lodged and first formed. Accordingly it accumulates there, obstructs and distends the air-vesicle, and gives origin to the numerous granulations of which the tissue of the lung, in red hepatization, appears specially formed.† Louis, judging from the appearances of an injected lung, has come to the same conclusion.‡ More recently, however, we find Andral changing the opinion he first entertained, and stating, that "the morbid alteration is produced by a considerable degree of sanguineous engorgement of the parietes of the capillary bronchia and air-vesicles, the effect of which is to diminish or obliterate their cavities."§ Such is also the opinion of Stokes.|| Another view has been adopted by Williams, namely, that the "granulations consist of little bunches of air-vesicles, whose membranous tunics have been so swelled by the deposition of a soft albuminous matter in them, as well as from the increased size of their blood-vessels, that their cavities are obliterated."¶ Hasse** and Rokitansky†† adopt the view first held by Andral, namely, that the granulations result from the filling of the air-vesicles with effused matter. From the foregoing review of opinions, it appears fully evident that the air-vesicles, or the cincture of blood-vessels surrounding them, may give rise to the appearances in question, from particular morbid changes occurring in these structures. It remains to be shown what these morbid conditions are. Is it an infiltration of the air-vesicles with an exudation of liquor sanguinis from the vessels, or is it an accumulated secretion of epithelium in the cells? From my own observation, I am inclined to consider that a granulated appearance to the naked eye may be produced, either by an exudation of liquor sanguinis from the cincture of pulmonary and systemic capillaries surrounding the air-vesicles, penetrating the diaphanous membrane lining the air-cell, or pressing the membrane together without such rupture; or, the appearances may be produced by an accumulated secretion of epithelium without any exudation of liquor sanguinis into the vesicle. The granulated appearance may also be produced by a combination of all

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* Bennett, Treatise on Inflammation, page 35. Hence Andral speaks of hepatized lung as *softened*.

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* On Diseases of the Chest (Forbes' Trans.), p. 201.

† Clin. Medicale, t. iii. pp. 312, 313.

‡ Researches on Phthisis, Sydenham Soc. Ed.

§ Pathological Anatomy (Trans.), p. 512.

|| A Treatise on the Diagnosis and Treatment of Diseases of the Chest, p. 312.

¶ Cyclop. of Prac. Medicine, t. iii. p. 410.

** Path. Anatomy (Sydenham Soc. Trans.), p. 209.

†† Handbuch der Pathologischen Anatomie, iii. band, p. 90.

of these conditions. In no two instances is it likely to be caused by the same morbid change; and, according to the stage at which the exudation has arrived in forming the granulated appearance, epithelium, compound granular corpuscles, or pus, will be found to be its component parts. Dr Henderson has found the granulations to contain "blood-discs, granules, and globular bodies," which he considers to be the cells of the epithelium; and if reference shall now be made to Case 7, detailed at page 34 of this paper, it will be found that the granuations could be picked out entire, and that the contents consisted of pus-like corpuscles, compound granular cells (exudation cells), and blood-discs adhering together. Under a low power (from 10 to 25) they appeared like large glistening cells with fluid contents, on whose outer surface little vascular twigs ramified. In Case 8 the granulations were composed chiefly of pus (see page 24). The condition of a lung which is the seat of an exudation of blood-plasma, I shall now describe as seen through the microscope.

After coagulation of the fluid effusion has taken place to a greater or less extent, the first change seems to be the formation of granules in its substance, so that a section of the tissue obtained by the aid of Valentin's section knife exhibits the pulmonary textures enclosed in a coagulum, and displaying a number of blood-discs imbedded in a nearly amorphous, slightly granulated or striated mass. At first no cells exist other than oval or cylindrical epithelium and blood-globules; but soon the formation of distinctive cells takes place in the exuded matter, and these cells assume a form of organization, first described by Professor Gluge as peculiar to inflammatory products in any part. Describing the alterations of the blood in inflamed parts, he observes, "that the blood-globules lose their tegument and their colour (a fact noticed previously by Gendrin), their nuclei alone remain; these, however, do not remain solitary, but by means of a whitish connecting substance become agglomerated, and form dense, opaque, round groups, containing on an average from twenty to thirty of the smaller bodies, which, examined singly, are quite light and transparent. By means of pressure or acetic acid, the associated granules break down into the individual bodies, and we see that the opacity is merely owing to the association. The associated bodies have a diameter in the mass of from $\frac{1}{50}$ to $\frac{1}{30}$ of a millimetre; the single granules are from $\frac{1}{500}$ to $\frac{1}{400}$ of a millimetre. These associated bodies," says Gluge, "I have seen in the blood-vessels, so that we have not here to do with a fluid which, transuding through the coats of the blood-vessels, is changed into granules. They escape by bursting the capillaries."* The idea entertained by Gluge, which I have now stated, regarding the formation of these bodies, does not accord with observation; and from the recent examination I have made of cases, in which the lungs were more or less involved by deposits in various stages of development, I shall describe, as far as I have seen, the conditions under which the corpuscles of Gluge are formed. (This is the "compound granular cell" or "exudation corpuscle" of Bennett and other pathologists.) That this cell or corpuscle is not formed within the blood-vessels, is apparent from an examination of the exudation of blood-plasma into many textures, and more particularly in the brain; for, first, the exuded matter coats the blood-vessels exterior to their walls; and, secondly, the formation of the corpuscle of Gluge can be traced through the following stages, as described by Vogel, Bennett, and Reinhart.

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* Anatomisch-mikroscopische untersuchungeu zur Allgemeinen und Speciellen Pathologie. 1st Heft, p. 13.

1. The formation of clear, transparent, non-nucleated cells may be observed.

2. The formation of cells with a nucleus and nucleolus are seen, differing from pus corpuscles in their large size (the 200th to the 100th of a line), and in having a single nucleus. These are formed in the fluid of coagulated exuded matter, and become gradually filled by minute granules, which, when few in number, readily admit of the nucleus being seen. Subsequently, however, they conceal it; and the originally smooth cell membrane becomes rugged, the granular cell appearing as a spherical agglomeration of granules. Subsequently the cell wall appears to vanish, the enclosed granules to separate from one another, and to fall into irregular heaps, and each individual granular cell to undergo, in a minute scale, the very same process which a mass of coagulated fibrin undergoes in its conversion into pus-corpuscles.*

As to the compound granular corpuscle thus described, I have found the following to be the general facts:—

1. They are formed in greatest abundance during the first stage of the exudation (the second stage of pneumonia, according to Laennec).

2. As long as the capillary circulation is going on, and before complete stagnation has taken place.

3. When the redness and condensation is the greatest, the corpuscles begin to disappear.

4. They disappear altogether as the red softening passes into grey.

5. They are imperfectly formed, or not at all, in the deposits that occur during the progress of typhus fever.

Other changes are also to be observed besides the formation of the compound granular cell in the deposits which take place in the lung. These changes are to be sought for in the simple textural elements of the part. The epithelium becomes enlarged in appearance. Originally, and in health, the epithelium cell lining the air-vesicles is of an oval form, but soon it decreases in size, becomes round, and loses its transparent appearance, or the cells become smaller, and of a more globular form. Two sources of change may thus be observed in the epithelium cells: (1) a change in the character of an individual cell; (2) a change of form depending on imperfect development, the cell being thrown off before it has arrived at maturity. The alterations perceived in the characters of the individual cells consists in their assuming a granulated aspect, approaching in form and appearance the compound granular cell. (Plate I. fig. 1.)

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* Vogel. Path. Anat. (trans.) p. 156.

It has been conclusively shown by Reinhart, that the epithelium cells are sometimes transformed into compound granular cells, but that they do not always arise from such a source is proved by their great frequency in cerebral softening, where such an explanation cannot altogether apply to their formation.*

The change in the form of the epithelium depending upon imperfect development is well seen in the cylindrical form of the scale. In place of being a fully-formed cylinder, it is much diminished in size, of an oblong globular form, and very often nonnucleated. When we examine the sputum of patients, in whom the pulmonary substance is the seat of exudation, we may discover the changes I have indicated as taking place in the epithelium, independently of the existence of irritation in the larger bronchia. I have also frequently confirmed the observation of Dr Remak, made in the clinic of Dr Schönlein, namely, that branched bronchial coagula are almost always present, the altered forms of the epithelia constituting a part of their microscopic elements (compare and connect this statement with the fact I have recorded at page 3, about the lung in cattle). They appear to be composed of delicate filaments running parallel to the long diameter of the cylinder. Sometimes we have granular forms in the deposits, forming the chief part in their composition, closely adherent, and in some respects very much resembling the casts of the kidney tubes occasionally found in the urine of Bright's disease. The granules and granular cells very much resemble the compound granular cell. They are generally, however, more finely granulated, and resemble the altered form of epithelium, of which I have just spoken; and when associated with the apparently imperfectly-developed cylindrical epithelium, there is little doubt of that structure forming a chief part in the constitution of these coagula. Besides altered epithelium, however, the compound granular cell does sometimes form a part of the coagulum. In general, acetic acid dissolves the cell walls, and sets the granules free, leaving them undissolved; the filaments also are dissolved by this reagent, so that the whole mass is rendered transparent, obscured only by the granules.

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* Vinchow and Reinhart's Archiv. i. 1. 1847. Monthly Journal for February 1848.

Cases illustrative of the formation of the Compound Granular Cell.

Case 1.—Bright's disease—softening of corpus striatum—dysentery—exudation in left lung organized in the form of the compound granular cell.

Kenneth M'Lean, aged 45, admitted under the care of Dr Douglas, August 8, 1847, suffering from Bright's disease. He died on the 12th of November.

DISSECTION.—*Head.*—Considerable subarachnoid effusion at different parts of the cerebral hemispheres. A portion of the right corpus striatum a little softened, rest of the cerebral substance apparently healthy. A microscopic examination of the softened portion of the corpus striatum showed the blood-vessels intensely injected, with extravasated blood around them, and the exudation of liquor sanguinis organized in the form of compound granular cells, which, with loose granules, existed in great abundance. These cells were not acted upon by acetic acid.

Chest.—Left lung completely condensed in the upper part, extending throughout its posterior half. When cut into, it presented a dark-red surface, finely granular, and emitted very little fluid on being squeezed. The lower lobe was not condensed, and emitted a frothy fluid on being cut into. The right lung was condensed in its inferior lobe, similar to the upper lobe of the left. On the superior lobe the bronchia had their vessels much injected, presenting an appearance of abnormal vascularity, with a copious exudation of mucus. A microscopic examination of the condensed portion of the lung made upon a thin slice cut out by Valentin's double knife, showed that these parts were completely void of air, and that their microscopical elements consisted of compound granular corpuscles, fine granules, and small globules of fat, with blood discs in abundance. (Plate I. figs. 3 and 4.) The fibrous tissue of the lung was distinctly seen, the individual fibres being more or less irregularly separated from each other by the presence of the granules and the compound granular cells. The usual empty interspaces formed by the fasciculi of the pulmonary fibres were also filled by these organized forms of exudation, but the whole could be washed away, leaving the fibrous tissue of the lung completely intact. In every part examined, the quantity of blood was considerable, and generally coagulated within the vessels. The aortic valves of the heart were slightly incompetent, and on one there was a slight deposit. The aorta itself presented numerous miliary deposits.

Abdomen.—Liver small, but apparently healthy. Kidneys granular—external cortical substance whitish and increased in extent. Lower part of the colon thickened, and the mucous membrane extensively ulcerated.

Remarks.—In this case Bright's disease of the kidneys was undoubtedly the primary affection, and the most important one as bearing upon the existence of a dyscrasia in the blood. That exudation of *liquor sanguinis* existed in the lungs, the brain, and the intestines, we had physical signs and constitutional symptoms during life, confirmed by dissection. The occurrence of convulsions some days before death, was not a symptom sufficient of itself to create a suspicion that an exudation of *liquor sanguinis* was going on in the brain, causing the appearance of softening it presented after death; but when we connect their existence with the tendency during Bright's disease to the "inter-current inflammations," then our suspicions might justly be excited by the occurrence of convulsions. The stage of hyperæmia, and of the formation of compound granular cells along with separate granules, constituted the organized elements of the deposits in the lung, along with an increased development of fat. Of the formation of fat in the lung, increasing with the amount of disease in the pulmonary texture, I shall have occasion to speak more at large in a future part of this paper. At present, it is enough to connect the two facts together, namely, the complete absence of air in the condensed portions of the lung (indicating that in the condensed part the lung was not performing any of the functions of respiration, as far at least as the oxygenation of the blood was concerned), and the existence of fat in the condensed portion in abnormal abundance. I shall attempt to show, that suspension of the functions of respiration in the part is one condition for the development of fat in the lung. From the length of time which this man had suffered, it is evident that exudation of *liquor sanguinis* in the lung and its reabsorption had been pretty equally balanced; and it is one of those cases of Bright's disease which shows (as all the other cases which I have examined tend to show), that there is no deficiency of organization or tendency to imperfect development of cells in the *liquor sanguinis* exuded into the textures during the progress of Bright's disease. In consequence of the nature of the existing dyscrasia, the exuded products, in organs seeming to be characterised by activity and perfection of organization, as shown by the general abundance of the compound granular cell.

There is another condition of the lung deserving of special notice, before considering the disintegration of that form of exudation in which the compound granular corpuscle forms the chief element of organization. The condition to which I refer is one in which the product of exudation assumes a fibrinous form, and becomes mingled with the pyoid corpuscles of Lebert, and sometimes with nucleated caudate cells. Under such circumstances the exuded matter is apparently more or less influenced by the nature of the texture in which it is effused; and, accordingly, a lung in which the exuded *liquor sanguinis* assumes such a form of organization presents appearances under the microscope which may be denominated *cirrhosis.* The fibrous meshes of the pulmonary tissue seem to be increased in thickness by the fibrinous material exuded becoming organized around the individual fibres. The cut surface of such a lung appears of a bluish tinge, somewhat fibrous, and accompanied by an increase in the consistence of the part which feels tough and resistent. Such a condition of the lung may either precede the formation of the compound granular cell in the exudation, or the *liquor sanguinis* may become organized in both these forms at the same time.

Case 2.—Pleuro-peripneumony.—Robert Gilmour, aged 13, admitted December 31, 1847, under the care of Dr Robertson, suffering from febrile symptoms of an inflammatory type. About a week after admission he complained of pain in lower part of left side, over the region of spleen, which seemed enlarged; till then no local pain existed. The whole left side of chest now became dull on percussion, the respiration harsh and bronchial, with expectoration of translucent tenacious sputa, sometimes tinged with blood. The cough increased, and the expectoration became more frothy and less viscid; so that, notwithstanding treatment, the oppression of respiration increased, friction could be heard on both sides, and he died eighteen days after admission.

DISSECTION.—*Chest.*—Pericardium distended, and containing about four ounces of darkish serum, in which floated numerous flocculi of lymph. Heart and valves healthy. Left pleura contained a large quantity of serous fluid. Its layers were partially adherent by an abundant deposit of a yellow colour and soft consistence. The adhesions to the diaphragm were firm. On the surface of the right pleura, over the lower lobe of the lung, there were a few small patches of recent lymph. The whole of the left lung, with the exception of the apex, was much condensed, and generally of a bluish-red colour, and in some parts so completely void of air as to sink in water. A section from the condensed portion, made by Valentin's double-bladed section knife, presented a granular or molecular aspect without reagents, interspersed by fibres, generally running in one direction, and sometimes crossed by the filamentous tissue of the lung enclosing the air vesicles. These air cells were thus generally obliterated, so that very few globules of air could be detected, and few compound granular corpuscles could be seen. Some large cells, however, containing granules and nuclei, were visible amongst the molecular and fibrinous material exuded, along with colourless cells (Plate I. fig. 6). The elements of the exuded matter presented the general appearance described by Lebert as pyoid corpuscles, enclosed amongst fibrinous matter, consisting of a semitransparent amorphous mass. The fasciculi of fibres composing the pulmonary tissue were well expressed, and appeared in abnormal abundance, evidently from the fibrinous substance exuded attaching itself side by side with the individual filaments. This was demonstrated by the addition of acetic acid, which clearing away the fibrinous matter, left the individual pulmonary fibres clearly distinguishable. No air was visible under the microscope, and generally the tissue was comparatively free from blood. In the fluid squeezed from the tissue, some pale nucleated and non-nucleated cells were visible, with very few compound granular corpuscles (Plate I. fig. 5). Between the root of the left lung and the pericardium, a circumscribed quantity of pus was contained, apparently enclosed in a reflected fold of the pleura. Right lung much congested; otherwise, under the microscope, its tissue appeared healthy.

Abdomen.—Liver appeared normal in size and structure. Between the lower aspect of its left lobe, the stomach, and the spleen, there existed a circumscribed abscess about the size of an orange, containing dirty-looking purulent fluid. This was found to communicate with a partially-softened mass the result of exudation, into the substance of the spleen, involving about one-fifth or one-sixth of the whole organ, the rest of which was soft. The mucous membrane of the stomach was swollen, and thrown into protuberances on the posterior surface of the viscus by œdema of the tissue underneath. Other organs healthy.

Remarks.—The extent of the local lesions displayed by this case after death,—accompanied and preceded during life by febrile symptoms, much constitutional irritation, and physical signs of disease,—abundantly testify to the existence of a dyscrasia in the blood—a dyscrasia such as inflammation excited by cold or injury may produce in a system previously quite healthy. In the lung, the exuded matter assumes an organized form of so perfect a kind, that I am inclined to add another modifying cause to the existing dyscrasia, whatever that may be, for the influence of tissue is apparent in this case, causing the exudation of the *liquor sanguinis* to assume a fibrinous form, so as to associate its elements with the filamentous texture of the lung itself.

From these observations, it is evident that the exudation of *liquor sanguinis* into the substance of the lung may become organized in all the forms I have now indicated; that the combination of all these elements, namely, an effusion of the colouring matter of the blood and of the blood-globules, along with the *liquor sanguinis*, passing into a more or less granular or fibrinous form, constitutes the second stage or degree of pneumonia, the red hepatization of authors, or the "*ramollissement rouge*" of the French. That these elements are susceptible of re-absorption, so that the lung may return to its normal condition, is still a problem unsolved. If this does not take place more serious changes follow. The immediate effect of the granular form of the exuded matter must be to compress the surrounding parts; and so long as exudation continues and is organized in that elementary form, a more complete stasis of the blood in the capillary vessels takes place; there is incomplete re-absorption and incomplete restoration of permeability to the pulmonary air-vesicles and capillary vessels; there is produced not only a local interruption to the circulation, but there is an impossibility of part of the blood undergoing the important change in the lungs of oxygenation, decarbonization, and the exhalation of moisture. The exuded material accordingly changes its nature and becomes purulent;* the formation of compound granular cells ceases to take place; those already existing become disintegrated; the blood-corpuscles extravasated with the exuded fluid undergo changes by which the globules become spherical, swollen, and at last break up; the whole mass assumes a more fluid form, and becomes entirely converted into pus. The changes undergone by the blood-corpuscle, when the exuded matter with which it is extravasated becomes purulent, differ from those changes which the blood-globules undergo when the condition of gangrene is about to be induced, and which I shall notice afterwards.

These observations also show that, with the condition of red softening, the greatest amount of constitutional disturbance exists, when much of the texture of the lung is implicated. The effects of impeded respiration and impaired sanguification become conspicuous, so that the existing dyscrasia (whatever that may be) is increased by the non-arterialization of the blood which passes from the lungs in a venous state into the general circulation. When this condititition is established, the functions of the brain become disturbed, and, in many instances, death takes place by coma. The dyscrasia becomes also more apparent in the sallow complexion and almost icteroid condition of the general surface.

The elmentary organization of the exuded *liquor sanguinis* in the form of pus-corpuscles, and the disintegration of the compound granular cell, constituting softening of the pulmonary substance by the infiltration of its tissues with granules and pus, now deserve special consideration. The circumstances under which the exuded fluid assumes the elementary forms of pus are also those which are conducive to the development of fat in the affected portion of the lung. Accordingly, the amount of fat in the lung accumulates from the period at which the compound granular cells begin to disintegrate, onwards to complete disintegration of the tissue of the lung itself; and this accumulation takes place independently of the contents of the compound granular cell being composed of fat granules. During fœtal life the fat contained in the lungs amounts to 10·18 per cent.; but, after respiration is established, the proportion of fat in the normal condition of the lung never rises to above 6 per cent.[*] When, however, a portion of lung is rendered impervious to air by disease, the fat accumulates, and becomes, in relation to the whole weight of the lungs, 15·40 or even 50 per cent., according to the amount of pulmonary tissue involved. In this way the amount of fat in the lungs becomes relatively as great as the amount of fat in the liver, which always contains a large proportion. In the normal state, fat is now ascertained to exist in small quantity only as an essential constituent of the nervous tissue, as in the nerves and brain;[†] and it is only under the following conditions that fat accumulates in the textures of the body. If reference be made to the atomic constitution of fat, as compared with the ingesta and egesta of animals, it shall be found that in every tissue the formation or deposition of fat stands in a definite relation to the respiratory process, depending on the conversion of the carbon of the substances destined for respiration into carbonic acid by combination with oxygen. The abnormal condition, therefore, which causes the deposition of fat in any tissue of the animal body, depends on a disproportion between the quantity of carbon and hydrogen in the food, and that of oxygen absorbed by the skin or lungs, the oxygen being deficient. In individuals possessing an abnormal tendency to fatness, the circulation is out of proportion with the digestion; and such persons have in general very small lungs.[‡] And, again, when the lung is diminished for the function of respiration, by any part of its substance becoming the seat of an exuded product, then that part is brought into circumstances analogous to any other tissue of the body, and subject to the same laws in regard to the deposition of fat. The production of fat is always a consequence of a deficient supply of oxygen, for oxygen is absolutely indispensable for the dissipation of the excess of carbon and hydrogen in the food; but the volume of air in which respiration goes on does not, under the influence of vegetable and animal life, undergo any change; and as the quantity of fat in the tissues increases when the oxygen absorbed by the lungs and skin in a given time does not suffice to convert into carbonic acid and water the elements of the non-

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* Lebert, Physio-Pathologique, vol. i. p. 128.

[*] M. Natalis Guillot, in Gazette Medicale de Paris, No. 29, 1847.

[†] Liebig's Animal Chemistry, 3d ed., p. 94.

[‡] Liebig, loc. cit.

nitrogenized constituents of the food, the condition of the lung itself must be considered, when exuded fluid into its substance has diminished its volume, as explaining the deposition of fat in its own diseased structure. A certain quantity of fat requires for its conversion into carbonic acid and water a certain quantity of oxygen; if this is withheld (as it always is to a greater or less extent in the part where exudation of *liquor sanguinis* has taken place) the fat is not consumed, but accumulates, for the blood conveys to the seat of disease the elements of fat in the form of carbon and hydrogen, with little oxygen; and these elements not meeting with more oxygen, are not dissipated in the form of carbonic acid and water, but are deposited in cells in the form of fat. If the lung, therefore, is to be looked upon as a structure destined for the elimination of fat from the system, the accumulation of fat in its texture during disease is to be regarded in the same relation as the non-elimination of urea in disease of the kidney, or the accumulation of any other product in the system which ought to have been eliminated according to the usual course of organic changes. During fevers, more especially typhus, the amount of emaciation, and consequent consumption of fat, must show, that if respiration is not performed by all parts of the lung alike, the elements of fat will not be consumed in those parts where respiration does not go on, but will be deposited as cells of fat, to be again absorbed and carried to those parts of the lung where respiration goes on, so long as life continues; or to those parts of the systemic capillaries where the formation of the carbonic acid and water, thrown off at the lungs, takes place. Of the accumulation of fat in the lungs under the circumstances I have now attempted to describe, I shall be able to offer abundant illustration in the cases that are to follow.

Regarding the formation of pus in the exuded *liquor sanguinis*, it is not yet clearly ascertained whether or not it is an independent organism. According to Vogel, it may be formed either from the matter exuded rendered solid, or from fluid exudation of *liquor sanguinis* before coagulation.* Pus has also been supposed to arise from the breaking up of the compound granular corpuscle. In the *liquor sanguinis* exuded into the lung, it is apparent in most of our cases that the elementary forms of compound granular cells and pus-corpuscles exist together; and that, independently of microscopical observation, it has been an opinion generally entertained, that the several stages of a pneumonia are always developed out of the stage immediately preceding, and that the change always commences in the centre of the diseased part. However various, therefore, may be the opinions entertained concerning the organization of pus in the exuded *liquor sanguinis*, there are only two possible conditions in which it can be supposed to occur.

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* Vogel, Path. Anat., p. 144, trans.

1. It must either be an independent organism arising primarily in the exuded *liquor sanguinis*: or,
2. It must result from degeneration of the compound granular cell or blood disc.

If, however, it is found to possess an independent existence, the circumstances in which it is generated are also those in which the compound granular cell tends to become disintegrated, a fact which leads us to conclude that, although it may possess an independent existence, yet it may be called into being by the breaking up of the compound granular cell, which had enclosed in its structure the nuclei of the purulent formation. Hence, while the whole of the exuded matter assumes the form of granular cells or granular masses, the purulent formation finds existence amongst the debris of their destruction, although they may be independent and elementary forms of organization. In the purulent form of organization which the exuded fluid may assume, there is first of all observed a bloodless appearance of the texture, and if blood be at all visible in an unchanged state, it is always coagulated within the vessels. In general, however, all trace of vascularity is gone, and a section of the lung where this form of organization has taken place in the exuded *liquor sanguinis*, is characterized by a colour varying from dirty-grey or light-yellow to a melanotic tint; the shades of colour depending on the amount of vascularity, the amount of pigment whether normally present or the result of disease, and, lastly, on the changes which may have taken place in extravasated blood. A section being made through the exuded matter, the divided surfaces become immediately floated over by the purulent fluid, which appears uniformly infiltrated throughout the pulmonary tissues, filling up the air-vesicles, and separating the fibres, which, by washing with water or acetic acid, may be rendered free and generally distinct.

There is still another condition of the lung connected with a granular appearance on section, which has sometimes been looked upon as a form of grey hepatization; but as it is not the result of the organization of exuded *liquor sanguinis*, but of an excessive secretion of epithelium,* I shall only speak of it in passing, and attempt to notice its occurrence modifying the appearance of the purulent organization in any of the eases I have to relate.

Cases illustrating the organization of the exuded liquor sanguinis in the form of pus, and the development of fat in the seat of lesion.

Case 3.—Owen Hastings, aged 36, admitted under the care of Dr Andrew, December 14, 1847. He underwent a severe attack of typhus fever, and his convalescence, although protracted, appeared to be going on favourably until the 2d of January 1848, when he complained of pain in the limbs, more especially the right, extending downwards from the knees, and attended with stiffness of the joints. There was no swelling of either limb, but the cuticle appeared to desquamate by small scales. On the anterior aspect of the right foot and leg there were some irregular patches of lividity. Three of the toes became almost quite black, their cuticle was hard and void of sensation throughout their distal phalanges; towards the roots of the toes the cuticle was slightly elevated. Immediately over the anterior aspect of the right ankle-joint there appeared some slight superficial ulceration about the size of a penny-piece, as if the result of a violent abrasion. No discharge proceeded from its surface, but the part appeared dry, hard, and scaly. By the 15th of January the swelling had extended to the knee-joint, and a sanious fetid discharge exuded from the ulcerated surface round the ankle-joint and the root of the little toe. On the 22d of January he had a violent rigor after leaving the bath, followed by increased heat of surface, and general vascular excitement followed by delirium. The right arm soon after became stiff at the elbow-joint, swollen, and painful. The pulsation in the right femoral artery was indistinct and small when compared with the left, and could scarcely be felt in the popliteal. For four days the condition of the arm became more painful; streaks of a purple hue stretched like cords along the inner aspect of the limb, which became highly œdematous. The circulation generally, both in the arm and leg, was languid, and the capillary circulation in the skin both of arm and leg was exceedingly feeble, as indicated by the length of time which any part took to regain its redness after being pressed upon. By the 30th of January, two of the toes of the left foot became discoloured at the distal extremity of their plantar aspect, and a red blush extended up the leg from the blackened part. An abscess formed on the ball of the great toe of the right foot, which opened and sloughed. An opening was made in the right arm, from which a quantity of fetid pus was discharged. The night before his death he suffered a severe rigor, followed by much dyspnœa and pain of chest. The whole right back became dull on percussion, and the lower part of the chest anteriorly; some crepitation could be heard in the infraspinous fossa of the scapula, and also in front below the nipple of the right side. He died on the evening of the 8th February.

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* Henderson on the Anatomy of Pneumonia, Cormack's Journal, vol. i. p. 717.

DISSECTION.—*External appearances.*—Considerable emaciation; scaly appearance of skin on extremities; sloughy gangrenous condition of the toes of right foot.

Chest.—Slight and recent adhesions between the pulmonary and costal pleuræ of right side. About a pint of exuded fluid existed within the pleural cavity of that side, of a greenish hue, turbid with flakes of lymph in a semi-fluid state. The left side free from adhesions. The right lung throughout its lower lobe was condensed, easily broken up, and on section presented a yellowish-grey colour. The cut surfaces were rapidly floated over by a fluid resembling pus,—a microscopic examination of which showed fat granules and globules in considerable abundance, also pus-corpuscles, and a very few compound granular cells. A Valentin section from the grey hepatized portion exhibited no compound granular corpuscles, but the whole tissue appeared infiltrated with pus-corpuscles and small nucleated cells (Plate II. fig. 2). So completely did the exuded material infiltrate the tissue, that the mass was almost opaque, and no trace of air vesicles could be distinguished. Acetic acid brought into view vestiges of the filamentous arrangement round the pulmonary vesicles, and exhibited the nuclei of the pus-corpuscles. The meshes also of the pulmonary tissue, before obscure, were now made distinct, and, although much separated by the infiltrated fluid exuded from the vessels, were individually entire, and by no means broken down (Plate II. fig. 3). No compound granular corpuscles existed in these sections, and no cells other than pus and globules of fat soluble in ether. In the fluid taken from a portion of the lung where the purulent form of the exuded matter appeared to be commencing, a few compound granular corpuscles could be distinguished. Blood-discs also appeared in coagulated masses, and clear colourless cells were intermingled with pus-corpuscles of the usual form. Some of these pus-corpuscles were surrounded by a pellucid wall, apparently containing fluid, amongst which the pus-corpuscles could be seen to float, moving from side to side of the cell (Plate I. fig. 8). A considerable amount of congestion existed around the grey portion, as seen by a section, but no trace of the pulmonary vesicles were observed. The fibres were irregularly arranged, and the compound granular cells were few; and in proportion as a section was taken more and more removed from the purulent form of the exuded matter, the compound granular corpuscles increased in abundance and assumed a more perfect form (Plate II. fig. 4).

Surrounding the grey portion, and gradually passing from the grey colour to the red, the texture of the lung was friable, and from it a frothy fluid could be squeezed. The redder portion was not quite void of air, but of a granular appearance on section, which appeared to be the points of organization of the exuded fluid into pus as shown by the microscope (Plate II. fig. 1). The rest of the lung was much congested. The left lung, although somewhat congested, appeared otherwise healthy. The heart was firm in texture, and healthy.

Condition of the arterial trunks.—A large, soft, dark-coloured coagulum of blood, about a foot and a-half long, partially decolorised, was withdrawn from the aorta. Microscopically, it presented the appearance of coagulated fibrin, the striæ being mingled with blood-corpuscles and colourless discs about the size of the blood-globule. The artery of the right leg was laid open from Poupart's ligament downwards. In it a coagulum of blood existed throughout, varying in thickness as the calibre of the vessel varied. The same appearances were observed in the common iliac of the left side. On the right side the coagulum ceased to exist about two inches above the site of the ulceration, on the anterior aspect of the foot, where the anterior tibial artery was found contracted, indurated, and adherent to the *venæ comites.* The exuded matter completely obstructed the canal of the vessel, rendering it quite impervious. It presented granular matter, granules of fat, and crystalline structures under the microscope (Plate I. fig. 9).

Abdomen.—Viscera healthy, except right kidney, which presented appearances of fatty degeneration.

Remarks.—From the records of this case, it appears that typhus fever was the first condition of disease, and that all the other pathological changes followed in the chain of events connected with, and in some degree dependent upon, the condition which preceded any particular state. The course of the typhus fever was characterized by the grave nature of its symptoms, both of excitement and of depression, although, during its whole progress it was unmarked by any symptom of local complication. It was not until convalescence was advancing (about the twenty-sixth or twenty-seventh day), and when the constitution seemed recovering from the first effect of the dyscrasia, that the vascular system showed symptoms, local as well as constitutional, that the coats of the arteries were the seat of some change; and the fact of exudation having taken place in the anterior tibial artery was demonstrated after death. That the capillary system seemed to participate in the disordered condition of the vessels is shown by the exuded *liquor sanguinis,* which, in the subcutaneous tissue of the arm, became organized in the purulent form, and which in the toes went on to gangrene; as well as by the scaly desquamation of the cuticle over all the parts contiguous to the more immediate seats of exudation. To a participation in this changed condition of the vessels, and also of the blood they circulated, I am inclined to attribute the exudation in the lung; and the relation subsisting between the changes in the blood-vessels themselves, and the purulent forms of the exuded fluid into the several parts, connect all these conditions as the sequelæ of typhus fever, which, although it had run its course, the coats of the vessels had suffered from the existing dyscrasia. It may be somewhat more difficult to account for the exuded material in the lung assuming at once the state of purulent organization. If we look, however, to the great amount of substance involved, which, in a few hours, became at once condensed by an exudation so abundant, as by its pressure to preclude the possibility of blood circulating through the parts, we observe that its vascularity became entirely obliterated, absorption of any portion of the exuded fluid was rendered impossible, the essential conditions for the development of the compound granular cell did not exist, so that in a few hours the exuded *liquor sanguinis* became at once organized in the elementary form of pus; or it may be accounted for it in another way, as suggested to me by Dr Alison, namely, that the inflammation producing the exudation in the lung assuming the erysipelatous character as well as that on the surface of the body, tended to promote to fluid or purulent, not to *plastic* effusion, and therefore not to the formation of compound granular cells. The suddenness of the exudation, however, the abundance of the material exuded, and its fluid condition (maintained in that state by the abeyance of absorption), all exercise an influence upon the forms of organization.

Case 4.—Edward Grahame, aged 20, admitted under the care of Dr Douglas, February 29, 1848, had been in bad health for some time, on account of which he had taken mercury in such quantities as to cause ulceration of the fauces and gums. His symptoms, constitutional as well as local, indicated a diseased condition of the kidneys and lungs. He died eight days after admission.

DISSECTION.—*Chest.*—Heart and pericardium healthy. Lungs on both sides were much congested. The whole lower lobe and part of the upper lobe of the left lung was condensed, void of air, of a yellowish-red colour, and friable consistence. It sunk in water, and on pressure, an oily, purulent looking fluid flowed over its cut surface. Microscopic observation showed that this fluid was composed chiefly of pus-corpuscles. It felt sticky when pressed between the fingers, and considerable turbidity was produced by the addition of acetic acid. From these phenomena it appeared that mucus or epithelium cells also formed no inconsiderable portion of the fluid. Accordingly, under the microscope, along with the pus, various forms of epithelium were seen apparently thrown off from the basement membrane before they had reached maturity (Plate III. fig. 4). Round forms of epithelium resembling pus were also seen, but acetic acid did not dissolve any part of the cell, as it did to the pus-corpuscles, and at the same time set their nuclei free. Granules of fat and globules of oil existed in abundance, soluble in ether, among which were also to be seen little forms resembling the "vibrions" described by Lebert[*] (Plate III. fig. 6), or they might be cilia shed from epithelium. This is the only time I have seen such an appearance, and therefore opinions ought to be suspended till more frequent observation shall furnish data. A Valentin section showed the air-cells completely disorganized and filled up by exuded material, the fibrous tissue by which they were surrounded irregularly distributed, so that the individual fibres were separated from each other by the infiltration of the exuded fluid and epithelium, as also of oil globules and fat granules. No compound granular corpuscles existed, and few blood discs could be seen (Plate III. fig. 5). Those which did exist were swollen, and apparently undergoing a change. No vascularity nor injection of vessels could be seen in the condensed portion, although these appearances prevailed around the seat of lesion. Acetic acid and washing with water rendered the texture of the lung distinct, and showed that the fibrous tissue was not broken down.

Abdomen.—In this cavity every organ and viscus appeared healthy except the kidney. Both were large, and had a considerable amount of granular deposit in their cortical substances.

Remarks.—The condition of the lung in this case shows, that the organization of the exuded matter in the form of compound granular cells cannot exist. How long exuded material had existed in its substance cannot with certainty be ascertained, the patient having lived only eight days after admission, and in such a condition as to preclude the hope of obtaining much information from himself. From the state of vascularity and injection in which the seat of lesion existed, it could only be expected that the exuded fluid would be organized in the form of pus. This state of vascularity could only be determined by the microscope, for the variety of colour in the healthy lung modifies its vascular appearance in disease. Accordingly, under the microscope no appearance of blood existed in the vessels, although, to the naked eye, the section of the lung was of a yellowish-red colour. The state of health in which this man appears to have been for some time previous to admission, and the treatment to which he appears to have subjected himself, is precisely one of those conditions of the constitution in which gangrene of the lung has been a frequent occurrence. Gangrene, however, had not commenced, as shown by the integrity of the pulmonary texture; and he appears to have died under the combined influence of cerebral oppression, *and the amount of texture involved* by the exuded material in the lung; both conditions being referable to the primary affection of the kidney. The appearance of vibrions (?) is another feature of interest. If such an appearance is really of the same nature as that described by Lebert, and which he found to exist in fresh pus from hospital gangrene, the condition of the lung, in the case I have related, is certainly ominous; and had life been prolonged, gangrene would in all likelihood have taken place, preceded by the generation of the parasites described.

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[*] Lebert: Physiologie Pathologique ou Recherches Cliniques, Experimentales et Microscopiques. Atlas, 1845.

From these cases, as well as from other observations, I may state shortly the conditions under which we may expect to find the exudation of *liquor sanguinis* in the lung becoming organized in the elementary form of pus. The conditions are,

1. A sudden exudation and abundance of exuded matter;
2. A great amount of tissue involved;
3. Diminished vascularity, and consequent
4. Abeyance of absorption, increasing the
5. Fluidity of the exuded fluid;
6. Breaking up of the compound granular cell, either liberating the nuclei of pus-corpuscles, or rendering the exuded material more fluid.
7. The stage at which the exuded matter is examined along with these conditions.

Having traced the organization of the exuded fluid through the most perfect forms of cell development, I come to consider it as terminating in a less perfect organization, depending on a specific dyscrasia of the blood, exercising a modifying influence over the forms which the exuded fluid assumes, as seen to the naked eye, and under the microscope in its more elementary parts. This dyscrasia is associated with the conditions of typhus fever, tuberculosis, and cancer. To the first of these conditions, namely, typhus fever, I propose to direct attention, as modifying the forms which exuded *liquor sanguinis* assumes during its progress, more particularly with reference to its condition in the lung.

A fluid condition of the blood is a characteristic feature in the morbid appearances of typhus fever; and there is reason to believe that such a condition also exists during life to a greater extent than in health, and that the exudations of its *liquor sanguinis* are but little plastic, of an unsightly dingy-grey, as if mixed with blood. The condition of the blood, however, varies with the stage of the fever, or rather perhaps the stage of the fever depends upon and varies with the state of the blood. During the first stage the blood is generally thick and dark, it coagulates rapidly, and forms a soft large dark-coloured clot. When examined at a more advanced period during the progress of the fever, it is found to be more fluid, of a scarlet colour; and latterly it becomes thin, watery, dark in hue, and ceases to coagulate. The following changes are also ascertained to take place in its constitution.

The watery portion of the blood increasing, the intensity of the disease increases, and not merely are the solid constituents at that period diminished, but also the salts and carbonic acid. Stevens found the chlorate of sodium to be specially diminished, and the fibrin has also been found decreased in the blood of typhus fever, and it decreases as the disease advances. Hence deficiency in fibrin, in blood corpuscles, and in albumen, with the occasional formation of a salt of ammonia, may be looked upon as constituting the phenomena of a dyscrasia at once the cause of the fever, of the exudation of *liquor sanguinis* in any organ, and a modifying agent in its forms of organization. Under these circumstances it is maintained by many German pathologists, and more especially by Vogel and Rokitansky, that during the progress of typhus fever, "a certain morbid material, possessed of peculiar properties, and having a tendency to undergo certain metamorphoses, is poured out from the blood into the textures of organs and the tissues of parts." The local lesion seems to consist in an exudation of *liquor sanguinis*, in which are developed imperfect cells, molecules and granular matter. It has been attempted to assign to this deposit, occurring during the progress of typhus fever, certain specific characters supposed to be sufficient to distinguish it from other elementary forms of organization which take place in *liquor sanguinis*, organized under conditions of disease other than typhus fever. Of the examples of organized exuded matter, said to be that of the typhus deposit, which have been pointed out to me, a place might as readily have been assigned to them amongst *any* other defective elementary forms of organization, if *the circumstances under which the exudation occurred* had not also been taken into consideration. In tracing the nature and progress of any exuded product, the effects can only be examined as they are produced; and it is frequently not until these effects have existed for some time that we have any opportunity of examining them, and then we must, in every case, take into consideration the condition of disease (or departure from the standard of health) under which these effects were established. The parts most liable to become the seat of this (so-called) typhus material; or, in other words, the parts most liable to become the seat of exuded *liquor sanguinis*, which undergoes imperfect organization, are "the mucous membranes, especially that of the small intestines; but it is also admitted that the substance of organs, as of the lungs, may, during the progress of typhus fever, become infiltrated with a material closely resembling that found in the small intestines. The frequency with which the intestinal canal becomes the seat of extensive disorganization during the progress of typhus fever in Germany and in France, has afforded abundant opportunities for a close examination into the nature and cause of this disorganizing process; and the conclusions most generally arrived at by pathologists of these countries are, that this morbid process is attributable to the deposition of, and subsequent metamorphoses undergone by a peculiar product, which they denominate "the typhous material." In this country the intestinal lesion has occasionally occurred; and although its occurrence may be rare, yet the exudation of *liquor sanguinis* into the substance of the lung, characterised by imperfect organization and the deposition of fat in abnormal abundance, has been a most frequent and fatal complication of typhus fever; at all events, according to my own observation, it has been so in this city during the epidemics of 1846, 1847, and 1848. The commencement of the exudation was always insidious, and when discovered it seldom yielded to those therapeutic agents employed with advantage when exudation of *liquor sanguinis* had taken place under circumstances other than typhus.

"Of 63 cases of fever in the Edinburgh Infirmary, inspected after death, between March 1, 1846, and June 30, 1847, the spleen was the organ most frequently found affected; and next to the spleen, the lung was the most frequent seat of exudation. In 15 dissections it presented more or less consolidation from exuded matter, always differing in general appearances from the characters of hepatization in idiopathic pneumonia. It varied in colour, from a dirty-yellow tint to a brown-chocolate colour, existing frequently in masses of irregular but decided outline, varying in size, and resembling very much the deposit in the spleen."*

Of 101 cases of pulmonary lesion, inspected after death, between June 2, 1847, and March 13, 1848, 56 were the result of exudations occurring during the progress of fever, 34 of which were cases of undoubted typhus fever, in which 5 had intestinal as well as pulmonary lesion. It therefore appears, that during the present epidemic in Edinburgh, while an unusual number of cases of typhus fever existed, with the intestinal lesion so well described by Dr Waters, in his Inaugural Dissertation honoured by the gold medal of this University at the graduation of 1847; yet the present fever in Edinburgh has been especially characterised by pulmonary complication, as former epidemics in Edinburgh have been. In the intestines the products of exudation appeared in the solitary and Peyerian glands of the smaller viscera, in the follicles of the larger, and in the glands of the mesentery.

In the texture of the lung I purpose now to examine the organization of the exuded *liquor sanguinis* as modified by the existence of typhus.

In all the cases of typhus fever where an exudation of *liquor sanguinis* took place, the part existed for some time in the condition of hyperæmia, until the coats of the vessels giving way, every texture became surrounded by the liberated fluid, and according to the existing dyscrasia, the form of organization was determined.

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* Bennett in Monthly Journal of Medical Science, p. 299. October, 1847.

Rokitansky divides the progress of the local lesion into four stages, considered more especially with reference to the intestines.*

1. Exudation of *liquor sanguinis.*
2. A characteristic amount of organization, as modified by the existing dyscrasia.
3. Softening and disintegration of this deposit.
4. The result of this disintegration in partial death of the involved textures.

These phenomena are apparent in whatever organ the local lesion exists. In the lung are found various degrees of consolidation, according to the state of the blood, and the state of disintegration in which the deposit exists.

Generally, the organ or the part of it involved is of an unusually high specific gravity, but the texture is more friable, and rapidly the whole exuded material, and involved texture passes into a soft pultaceous mass. Its colour, when the process of disintegration has not commenced, is generally of a slate-grey or flesh colour; and when the deposit is well marked, it is limited by a vascular boundary, forming a line of separation between comparative health and local lesion, where all the vital changes take place connected with the loosening and disintegration of the mass. The exuded product never attains that degree of organization which it acquires when no such dyscrasia as typhus or tubercle exists. It takes place in the same manner, and holds the same relations to parts, as the exudation of *liquor sanguinis* under the conditions I have already considered. It fills the air-cells and interspaces, and undergoes changes in its organization depending upon the dyscrasia, as exuded products under other circumstances do. Its distinguishing feature is the imperfect power of organization which it displays. Round, irregular, and easily-dissolved cells are the highest forms of organization hitherto found in the deposits in the lung, always associated with numerous molecules and granules, whieh become more abundant as the process of softening advances. More frequently, however, molecular and granular matter, associated with particles of fat in unusual abundance, are all the morbid changes that can be detected; and when the lesion is at all extensive, or has existed for any length of time, fat is an invariable constituent; and generally the forms of the compound granular cell are entirely absent, the granular form of the exuded matter existing in masses without being enclosed in a cell wall. If the compound granular cell shall be considered as the highest form of organization which any exudation of

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* Handbuch der Pathologischen Anatomie. Von Carl Rokitansky. III. Band, pp. 239, 240, 242.

liquor sanguinis can assume next to conversion into a texture analogous to another texture of the body, the imperfect and abortive attempt at organization in the material exuded during typhus fever is a feature whose constancy is worthy of observation. That the compound granular corpuscle is the highest form of organization, appears evident by reference to the conditions under which it occurs; and it is only in the early stage of typhus that such organizations appear. More frequenty, however, the exuded matter assumes the form of masses or clusters of granules; and as the disease advances, or when the products of exudation are examined at a later stage, then these granules have become still more diffused, mingled with small globules and granules of fat. This condition of the compound granular corpuscle, or rather of the granules which ought to compose it, affords a marked illustration of the power which the typhus dyscrasia exercises in modifying the organization of the exuded *liquor sanguinis*.

The period at which exudation seems to take place, or within which the typhus dyscrasia seems to exercise its greatest influence as a modifying agent, appears to be between the first and the tenth day; and when once the exudation takes place, it seldom recedes, accounting for the failure of the usual therapeutic agents, in modifying the symptoms, or in promoting resolution when the exudation is at all extensive. The diagnosis of exudation into the lung during the progress of typhus fever can only be made out with certainty by the stethoscope, constitutional symptoms being generally entirely absent or altogether obscured by the typhoid condition. The changes which the exuded matter undergoes are its conversion into imperfect cells (which cannot be recognised independently of their situation, and the circumstances under which they are formed), softening or disintegration of the exuded product, frequently accompanied with death of the texture of the lung itself. The cause of this imperfect organization I have already stated to be the morbid condition of the blood, as characterised by its deficiency in albumen and fibrin. The deficiency in albumen cannot be without its influence on the process of organization; and when we connect this deficiency with the facts which I have to record regarding temporary albuminuria occurring during the fever, still more importance may be attached to the influence of such a morbid condition of the blood.

Cases illustrating the modifying influence of the Typhoid State upon the organization of liquor sanguinis exuded into the substance of the lung.

Case 5.—Elizabeth Callender, aged 32, admitted August 3, 1847, under the care of Dr Robert Paterson. She was treated in one of the tents at that time pitched behind the hospital. She suffered from an attack of relapsing fever followed by typhus, of which she died on the 15th of August.

DISSECTION—*Chest.*—Left pleuræ slightly adherent by matter of a yellow colour recently exuded, which was easily broken up. The inferior lobe of the lung presented two dirty-yellowish patches, the larger the size of a five-shilling piece, the smaller the size of a half-crown piece. On section, these were found to correspond with two depositions in the parenchyma of the lung very much resembling the deposits in the spleen described by Rokitansky as typhoid. A microscopic examination showed this deposit to consist of an exceedingly fine molecular matter, without any trace of cell formation, intermingled with granules of fat, which ether dissolved, and acetic acid rendered the whole more transparent. (Plate II. fig. 5.) No compound granular corpuscles could be seen, and few blood discs. The whole exuded material was intimately mingled with the pulmonary fibres, filling completely and obliterating the pulmonary vesicles. In the vascular boundary, which defined and separated these deposits from the pulmonary substance, the blood-vessels were irregularly and unequally filled with blood. Exudation granules and globules of fat also existed in abundance, along with some broken-down or imperfectly-developed cells. (Plate II. fig. 6.) The upper lobe of this lung was congested, but no exudation had taken place. It yielded, on pressure, a copious frothy fluid. The right pleura was adherent throughout by dense chronic adhesions. The lung itself was puckered in two places,—very deeply in the inferior and middle lobe, and very dense to the feel. On section, the puckering corresponded to a firm, fibrous, slate-coloured cicatrix of stellate shape, the parenchyma surrounding which was of considerable density, from an increase of fibrinous development. The heart was healthy, but felt soft and flabby.

Abdomen.—The spleen presented in its centre a deep stellate puckering, corresponding on section to a firm cicatrix. Externally, at the puckered part, it was adherent by old bands of lymph to the diaphragm and peritoneum. Other organs healthy.

Remarks.—From the history of this woman, previous to admission, it appeared pretty evident that she had suffered from the first attack of the relapsing fever; and that, during its relapse, when she came into the hospital, typhus became developed. Her non-exposure to contagion is improbable, considering that her occupation was that of a washerwoman amongst the lowest purlieus of the city.

In connecting the symptoms of local complication with the appearances found after death, it is evident that the exuded matter in the left lung is the only lesion to be associated with her last illness; and the two facts, namely, the previous existence of spotted fever, and the appearances of old adhesions between the spleen and diaphragm, and of old deposits and cicatrices in the spleen and right lung, are worthy of being connected. The deposit in the left lung is the exudation of *liquor sanguinis*, whose organization has been modified by the present existing typhus dyscrasia. It occurred during the progress of the fever, manifesting its presence by increased constitutional disturbance, as well as physical signs, between the sixteenth and twenty-first day. Its microscopic characters I have described as molecular, amorphous, and opaque, intermingled with fat, and in some parts with exudation granules; all which appearances I look upon as the effects of the modifying influence of the typhus dyscrasia. She reported that she had suffered from typhus three years ago; but it is more consistent to suppose that she suffered from the epidemic fever prevailing at that time, with the existence of which I am inclined to associate the deposits and cicatrices found in the spleen and right lung. The most frequent deposits in the spleen have been found associated with short fever or its previous existence, as dissection and inquiry have shown.

Case 6.—A child two years of age, who expired under typhus, had an exudation of *liquor sanguinis* into the parotid gland; and the exuded material which filled the right lung existed in masses, some of which had commenced to disintegate. Two or three of the masses were excavated by central cavities, which were empty and collapsed, very much resembling the excavations left by the sloughing of a solitary intestinal follicle after disintegration of the (so-called) "typhous matter." No compound granular corpuscles could be detected in the exuded products; and the air-cells seemed to be the chief seat of the exuded material, whose elementary forms of organization consisted in granules associated with abundance of fat. The bronchial glands were slightly enlarged.

Remarks.—In this case I had reason to believe that exudation into the bronchia was the condition which immediately preceded an extensive exudation into the air-cells themselves, expanding the pulmonary vesicles after the manner I have described.

Case 7.—Typhus;—exuded products into left lung, with destruction of its texture.

John Brennan, aged 23, admitted under the care of Dr Andrew, January 10, 1848, suffering from typhus fever, and reported to be eight or ten days ill. He died thirteen days after admission.

DISSECTION.—*Chest.*—Recent adhesions between the pulmonary and costal pleuræ of both sides. On the left side lymph had been recently exuded. Both lungs were much congested. The right lung was somewhat condensed in its lower lobe, and very friable. The left lung throughout its lower half was of an intensely red colour, and so friable as to break down under the finger with the utmost ease. Its surface was here and there interspersed with exuded matter of a whitish appearance, which on section presented points varying in size from a pin head to a barleycorn. These products of exudation were soft, and exuded on pressure a whitish substance resembling pus. They only existed in the lower half of the lung of the left side. On section the cut surface soon became very red and pultaceous, so that the particles of exuded matter could easily be picked out, leaving a cup-shaped depression in the soft pulmonary substance. Observing them in their natural position when not opened into, they presented an opaque whitish aspect surrounded by a distinct vascular base, resembling the summit of a pustule just approaching maturity. When removed from the lung and viewed through a low power (10 to 20 diam.), they appeared like large glistening cells with fluid contents, on whose outer wall little vascular twigs ramified. (Plate III. fig. 9.) They had none of the raspberry appearance described by Dr Addison in Guy's Hospital Reports, Vol. I., 2d Series. Their contents seemed to consist chiefly of pus-corpuscles, granular products of exudation, and blood discs adhering together. (Plate III. fig. 8.) The pus-corpuscles were imperfectly organized, or might by some be considered as young and altered epithelium. These elementary constituents were associated with fat. At the base of the lower lobe, a patch about the size of a half-crown piece, of a dark grey colour, and surrounded by a dark purple circumference, appeared upon the pleura. A section through this patch showed a gangrenous cavity about the size of a walnut. The dark purple appearance extended through the lung, and surrounded the cavity, which contained a dirty-white granular matter, easily washed out, and seeming to consist of chalky like particles. A membrane was exposed lining the cavity, which was crossed by the fibrous tissue of the lung. This part exhaled a very fetid odour. The misroscopic appearances of the material from the gangrenous cavity exhibited oil globules, granules, pus-like cells, blood discs, and "exudation masses" or compound granular cells modified by the existing dyscrasia. (Plate II. fig. 7.) The fluid from the upper lobe of the left lung was composed chiefly of coagulated masses of blood, of nucleated and non-nucleated transparent cells, and of exudation cells modified by the existing dyscrasia. A Valentin section from the friable portion of the lung surrounding the cavity showed altered blood, whose hæmatin had coloured the surrounding parts, but the pulmonary fibres were unbroken except within the cavity. (Plate III. figs. 1 and 2.) The bronchial glands were much enlarged, varying in size from a bean to a small egg, and slightly melanotic. Heart flabby, with a decolorised clot in the right ventricle; blood otherwise fluid.

Abdomen.—Liver somewhat congested, spleen soft and small. Other organs healthy.

Remarks.—In connection with these last two cases, there are several points deserving of notice; namely, (1) a great amount of fatty matter deposited, more particularly in the last case—a condition we must connect with the long-continued dyspnœa, depending in part on the cerebral oppression, as well as on the obstruction offered to the oxygenation of the blood by the amount of tissue involved by the exuded *liquor sanguinis;* (2) the condition of the exuded matter, as shown by its resemblance to the typhoid ulcer; and, (3) the enlargement of the bronchial glands completes an analogy between this morbid condition of the lung and the state of the intestines and mesenteric glands when they become the seat of exudation during typhus fever.

I would also remark in passing, that enlargement of the bronchial glands is a morbid condition almost invariably connected with some morbid condition of the lung itself, and ought not to be considered a disease *per se.*

Another case whose particulars I am unable to record for want of room, presented all the appearances of imperfectly-organized products of exudation connected with the typhous dyscrasia, along with an abnormal amount of fatty matter. An interesting and unusual feature distinguished it from all the rest, which was temporary albuminuria, apparently connected with the presence of pus in the urine. The interesting question regarding the absorption of pus at once presents itself; for its presence in the urine did not depend upon renal disease, nor upon any discharge from the genito-urinary organs. Pus, however, had existed in the lungs, and from the pulmonary tissue its presence in the urine is to be accounted for.

The absorption of pus, it is ascertained, may take place in two ways;* (1) as real pus absorbed by the vascular system, a lesion taking place in the coats of the vessel; (2) by the pus-corpuscle undergoing changes, rendering it fit for absorption as well as for elimination by the excretory organs. By both of these ways may the presence of pus in the urine be accounted for. A passage is obtained for the corpuscle through the pulmonary veins, whence it finds its way to the left ventricle; from which, by the blood, during the eliminating action of the kidneys, it appears in the urine either as pus, or as the crystalline formation of its metamorphoses.

Suggested by this case, and in reference generally to the cases of typhus fever, connected or not with exudation into any organ, I have still another condition to notice, and to which I am inclined to attach some importance in reference to the influence it may possess upon the phenomena of the existing dyscrasia. I refer to the diminution of albumen in the blood, which may be connected with the temporary albuminuria sometimes found to exist during the progress of typhus fever, as well as during exudations into organs such as in pneumonia.

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* Zimmermann on the Absorption of Blood and Pus. Medico-Chirurg. Review, 1844.

Dr Finger of Prague has found albuminuria, independent of renal disease, to exist in 155 cases out of 600 of various acute diseases, and that, next to tuberculosis, the temporary albuminuria occurred most frequently during typhus fever; next to which, in the order of frequency, followed puerperal fever and pneumonia. That in those cases of typhus fever which proved fatal, the intestinal complication existed in most, and the pulmonary in the remaining. We also find his researches showing that the albumen appeared in the urine generally from the sixteenth to the twenty-fifth day, while the disease was on the increase or at its height. In those who recovered, it uniformly declined and disappeared during convalescence. In 9 out of 15 cases of pneumonia, it disappeared during recovery. In 6 who died, no disease of kidney could be detected. In 26 cases of typhus fever, in which extensive exudation had also taken place into the lungs, I examined the urine in each, and found temporary albuminuria to exist in 6; and the following table (see next page) shows the conditions of the urine and stage of the disease at which the albuminuria appeared.

Of these six cases three recovered and three died, but in all of them, with the exception of one, the albumen disappeared, and in none was there any evidence of renal disease. In all the cases the albumen appeared on an average about the sixteenth day of the fever, and about the sixth or seventh day after exudation had occurred in the lungs. The average density of the urine appears to have been about 1024 at the time of coagulability. The disappearance of the albumen appears always to have been followed by a more or less abundant crystalline deposit, when the average density diminished.

Dr Finger, from his observations, concludes that the presence of albumen in the urine, along with fibrinous or purulent products of exudation into any organ, is in consequence of these products of exudation becoming absorbed and eliminated again as albumen by the kidneys. There is some inconsistency, however, about such an explanation, when we find that the albumen is invariably present in the urine during the exudation, formation, or organization of the exuded matter, in whatever organ it may take place, and that, during the resolution of this exuded matter, the albumen is absent at the very time when the products of exudation are being absorbed into the current of the circulation, and associated with an abundant crystalline deposit in the urine. From my own observation, I am inclined to regard the existence of albumen in the urine unconnected with renal affection as a symptom or part of

TABLE I.

Sex.	Age.	Day of Typhus.	Day of Exudation.	Character of Expectoration.	Character of Urine.	Result and Remarks.
Fem.	21	12	6 or 8	Viscid, purulent, bloody.	Coagulable, not transparent. Acid, sp. gr. 1·028.	
		18	12or24		Not coagulable—dens. 1·026.	As convalescence advanced, amorphous urates and epithelium appeared. Cured.
Fem.	18	17	6 or 8	purulent.	Coagulable — amber colour—acid— pus in urine.	Died. No disease of kidney—pus in urine from the lungs by absorption.
Fem.	19	20	?		Coagulable — yellowish-red—acid — sp. gr. 1·026.	
		28			Not coagulable.	Erysipelas of scalp.
		32			Not coagulable — sp. gr. 1·011.	Abundant crystalline deposit. Died. No dissection.
Mal.	21	22	10		Coagulable—blood — sp. gr. 1·019.	
		26	14		Coagulable — density 1·028 alkaline—uric acid crystals.	
		33	21		Not coagulable.	Abundant crystalline deposit. Died. No examination permitted.
Fem.	27	12	6 or 8	Scanty.	Coagulable—not clear—sp. gr. 1.020.	
		24	18or20		Not coagulable.	Amorphous urates. Cured.
Fem.	21	15or16	9or10	Muco-purulent.	Coagulable—turbid—of a light gamboge-yellow—sp. gr. 1·015 neutral triple — phosphates.	
		24	18or19		Not coagulable—acid—sp. gr. 1·019.	Abundant crystalline deposit. Cured.

the constitutional disease. Its deposition by exudation into the pulmonary substance, for example, constituting, according to its elementary forms of organization, those conditions which in this paper I have attempted to describe ; its existence sometimes, along with an excessive elimination of urea in the urine during typhus fever, constituting part of the phenomena in the typhous dyscrasia. In short, its co-existence in the urine along with local products of exudation of various kinds, as well as during diseases where apparently no such exudation occurred, must lead us to conclude that the albuminuria is a part of the disease; and its disappearance during convalescence still more confirms such an opinion. It is known farther, that in every disease there is a greater or less alteration in the state of the secretions; and probably, if more extensive investigations were made into the nature of the various excreted materials during acute diseases, phenomena would probably be found compatible with those conditions of disease in which albumen is deficient in the blood, eliminated by those organs and textures where changes in the blood take place during the processes of secretion and nutrition, as in the glandular structures, where it might either constitute an organized product of exudation, as in the lungs, or be eliminated along with the proper fluid eliminated by the gland, as with the urine secreted by the kidney. It is true we do not find such a condition in every case, but neither do we find tubercles in every organ, although tuberculosis is undoubtedly a constitutional disease; neither do we find carcinoma in every organ, although a constitutional disease; neither do we find exudation of *liquor sanguinis* in every organ, nor always in any organ during typhus fever, although a dyscrasia evidently exists. Temporary albuminuria therefore is the more likely in proportion to the duration and severity of the constitutional symptoms, the nature of the existing dyscrasia, the extent of local lesion (such as the amount of lung involved by exudation), as well as in the functional activity of those organs where the blood undergoes a change for the purposes of life.

All the cases I have recorded of typhus fever are characterized by one feature, namely, imperfect organization of the exuded *liquor sanguinis;* but, independent of this, I have not found in any case characteristic cells which could be called "genuine typhous deposit," according to the classification of Rokitansky. It is generally in the mesenteric glands that the most perfect and highest degree of organization in the cell is said to take place, constituting the "genuine typhous deposit of Rokitansky," and therefore it is, that from this very localization I would doubt the existence of specific characters in the cell. It is sufficient to know, that in all cases of undoubted typhus fever, in which any exudation takes place into the texture of organs, the exuded products are marked by the absence of the perfect compound granular cell, and of perfect pus, and always present imperfectly-organized forms, granular masses, molecular and fatty matter, characters sufficient of themselves to distinguish the products of such exudations occurring during typhus fever from the usual forms of organization, as I have seen in Bright's disease, or in a pneumonia occurring in a healthy person, where we have the most perfectly organized forms existing.

Certain it is, therefore, as these cases abundantly testify, that the existence of typhus fever modifies the exudation of *liquor sanguinis* in whatever organ that exudation may take place.

The last form of organization I have to notice, as having observed the exudation of *liquor sanguinis* to assume in the lung, is one of rare occurrence, in the human species at least,—I mean the formation of cartilaginous masses. In the museum of our university, there is preserved and beautifully injected, the lung of a dog, extensively infiltrated by an exuded product of a cartilaginous nature, existing in large nodules, apparently surrounded by healthy pulmonary tissue. The dog had evidence of a dyscrasia existing, if we may judge from the nature of the exuded matter and from the universality of its existence in the bony skeleton itself. All the bones throughout every part of their surface were the seat of an exuded product, with the exception of those parts subject to friction, as at the joints, or where the action of muscle, aponeurosis, or tendon exercised a similar influence. This exuded material was apparently organized as bone beneath the periosteum, traversing the Haversian canals, and even appearing in the medullary canal itself, as seen by a longitudinal section of a long bone. The exuded products existed in the form of little granular masses and spiculæ or small papillæ.

Case 8.—January 8, 1848.—At the dissection of a female, aged 65, who died from the effects of gangrene of the left superior extremity, there was found in the left lung five hardened masses, varying in size from a small pea to a nodule the size of a filbert. The smallest of these masses appeared to be a tubercle. It was soft, of a yellowish-white colour, enclosing in its centre a darker speck. Under the microscope it appeared to consist of granules distinct from each other, a few corpuscles, generally of an irregular form, containing two or three of these granules as contents. Another mass appeared like a nodule of cartilage enclosed in a cyst, to which it was adherent by blood-vessels. It was vascular and cut-like cartilage, disclosing a small triangular cavity in its interior, containing about two drops of a glairy fluid, chiefly composed of blood-discs. The lining membrane of the cyst in contact with the nodule was lined by epithelium, and was highly vascular. It seemed to be surrounded by healthy pulmonary tissue, which was the case with all the masses, so that they appeared as if harmless foreign bodies; and if once tubercular, they had lost their malignant type. In this mass the microscope disclosed cartilage cells surrounded by fibrous tissue. (Plate III. fig. 3.) These cells were not affected by acetic acid, and were easily put out of their relative position by the slightest pressure. Having made out the identity of this mass with cartilage, the question immediately suggests itself, namely, "how came cartilage there if tubercle once existed?" It is not improbable that cartilage presenting such an appearance in the mass at one time enclosed a tubercular cavity; for it has been found, and stated by Louis (Researches on Phthisis, page 9), "that when the disease is of long standing the membrane investing the cavity is dense, almost semitransparent, semicartilaginous, about a quarter of a line thick, and generally itself lined with a second membrane." It is therefore possible that such a cavity once existing in the case I have mentioned, may have contracted upon itself until it has assumed the shape, size, and general aspect described. A cartilaginous tumour developing itself in a gland is rare, and its mode of *epigenesis* is not yet explained. The most probable explanation of its *existence* is the one I have related, and the chances are in favour of the pre-existence of tubercle, since one of the little masses presented all the appearance of a tubercle, both microscopically and to the naked eye. The other cretaceous masses were not uniformly hard, but varied in consistence in different parts, and in some of the softer portions the characters of tubercle were apparent. The harder parts consisted of chalky particles quite amorphous, breaking down under pressure in water, rendering it turbid and white. In all the cretaceous masses numerous crystals of cholesterine were found, bearing testimony to the advanced age of the morbid product. The structure of the lung surrounding each of the masses, although healthy in general appearance, was much condensed in their immediate vicinity, with here and there a considerable quantity of spurious melanotic deposit (black pigmentary matter) arranged in irregular masses, and composed of a number of minute granules aggregated together. The great abundance of this deposit is another proof of the old formation of the masses. If we refer to the researches of Lebert on tuberculosis, we find that the most important element in the interior of a pulmonary ulcer is an organised *membrana pyogena*, intimately connected by minute blood-vessels with the subjacent pulmonic tissue, and presenting a reddish velvet-like vascular appearance. In the predominance of fibrous tissue, and the small degree of vascularity, this structure sometimes assumes a cartilaginous appearance. In this way I imagine the organization of the exuded matter has taken place in the case I have described, which seems to be a most perfect illustration of the healing of tubercle, both by calcareous transformation, as well as by the exudation and organization of *liquor sanguinis*, effecting cicatrization by contraction of the cavity.

Such are the forms of organization and the anatomical relations which exuded *liquor sanguinis* may assume in any organ; and from the cases I have related, it must be apparent, that according to the morbid condition of the blood, so is the organization of the exuded material; and, that of all morbid conditions, typhus fever exercises the greatest modifying influence.

Hitherto I have considered the products of exudation in all its forms of organization, and find that for the most part they pass into temporary forms which do not involve the proper tissue of the lung either in their growth or their destruction. The only lesions of structure which exist in the substance of the lung itself are rupture of blood-vessels, and generally, also, solution of continuity in the lining membrane of the air-cells, with a separation of the individual fibres from one another in consequence of infiltration by the organized forms of the exuded matter. There is therefore no physical reason why these temporary forms originating in the products of exudation should not by their reabsorption leave the proper texture of the lung comparatively uninjured. It is not, therefore, the amount of texture destroyed in the lung which is the cause of death, but it is the amount of texture which, for the time being, is rendered unfit for the exercise of those functions essential to life, and which, if suspended for a time, necessarily cause death. The exuded matter, however, does sometimes display a tendency to become rapidly disintegrated, and to involve in its destruction the tissue of the lung itself. The breaking up into fragments, and disintegration of the filamentous tissue of the lung, constitutes the condition of "gangrene," in which every simple element of the texture becomes changed; neither blood, fibres, nor epithelium can be seen in their perfect form; and the whole mass is converted into an amorphous granular character, of a yellowish-brown or black colour, mingled with drops of fat. The tissue becomes soft and flaccid, in some parts perfectly liquescent, and emits a fetid smell. The texture becomes broken up, and shreds of fibrous tissue are here and there to be seen by the microscope along with the debris of textures in various forms. I shall not trespass upon the limits of the Journal by a recital of cases. Suffice it to say, that they present nothing which has not been already observed in cases of a similar kind. The rarity, invariable fatality, and apparently mysterious character of pulmonary gangrene, has obtained for it a melancholy interest wherever it has occurred; and, accordingly, since Laennec directed attention to its peculiar characters, pathologists of the greatest ability have contributed to the records of the disease. Notwithstanding the researches of Andral (1822), of Lorinser, of Schrœder Van der Kolk (1826), of Bright (1827), of Cruveilhier (1833), of Guislain (1836), and of Craigie (1841), it is still a condition at all times difficult to diagnose, and its existence is often unknown until the disgusting appearances after death proclaim a condition which general symptoms during life failed to disclose, and hardly ever led to a suspicion. The diagnostic symptoms usually recorded are derived from the expression of the countenance becoming small, pinched, and contracted, haggard, ghastly, miserable, and death-like, eyes sunk and void of lustre, patient squeamish and languid, with occasional vomiting, and a feeling of indifference to all external objects, all of which symptoms may or may not be associated with a disgusting fetor of the breath, but which when present may be considered conclusive. Not one of all these symptoms, however, may manifest themselves, and yet the condition of gangrene may exist. From the recorded cases, therefore, as well as from the cases I have seen, it may be of some importance to classify the conditions of disease in which pulmonary gangrene has occurred, considering that the causes determining to gangrene of the lungs are still acknowledged to be unknown. The exudation of *liquor sanguinis*, terminating by gangrene of the lung, is by all authors considered as one of the least frequent terminations. Morgagni only records one case, and Laennec is reported to have seen only six or eight during the whole course of his practice. That exudation of *liquor sanguinis*, however, does sometimes terminate in gangrene, is clearly shown, both by constitutional symptoms and physical signs during life, confirmed by the state of the surrounding parts after death. The insidious and often sudden mode of its attack, the sudden, remarkable, and fatal collapse which supervenes, show at the same time that no local condition is suspected to account for the presence of gangrene. The extent to which the destruction takes place also varies much. In every case we have the formation of a slough, its liquefaction, and the establishment of a cavity. Sometimes we have nearly the whole of a lung going at once into gangrene. At other times we have only a small portion in the centre of exuded matter, as in Case 7, related at page 34. Sometimes we have a line of separation attempted to be formed; at other times we have no attempt made to limit the extent of the destruction; and this latter diffuse condition I have generally found associated with cases in which some dyscrasia existed as in typhus fever.

Of 15 cases recorded by Guislain—
    All were maniacs.
Of 3 cases recorded by Van der Kolk—
    1 was a maniac,
    2 laboured under a peculiar condition of the body.
Of 6 cases recorded by Dr Craigie—
    2 were mentally deranged with lesion in the brain,

2 suffered from Bright's disease and mercurialism,
1 had variola, and
1 had typhus.

Of 15 cases in our own hospital—

4 had typhus,
3 fever (type not noted),
4 suffered from ill health and mercurialism,
2 had tuberculosis,
1 suffered a blow,
1 had lesion in the brain.

These cases may be classified as follows:—

19 cases connected with and influenced by lesions in the nervous centres; under this class I include the insane.

19 cases connected with and influenced by the presence of a dyscrasia, such as typhus fever, variola, tuberculosis.

1 case connected with and influenced by arterial obstruction, causing pressure upon the entire mass of the affected parts, and total absence of circulation in the part.

The frequency with which lesions of the lung co-exist and succeed to disease of the brain, renders it at once apparent that the condition of the lung is materially affected by the influence of the nervous centres. In the cases recorded by Andral and Bright, diseases of the lung frequently going on to gangrene were often the immediate cause of death in patients suffering from cerebral disease; and it was also observed that the tendency to gangrene succeeding inflammation of the lung was promoted by the actual existence of disease in the brain. Cruveilhier has also directed attention to the frequency of gangrene of the lungs in epileptic subjects; and it has been remarked, that the insane are particularly prone to the disease, more especially when the bodily health has suffered, or where, as in maniacs, a greatly-depressed state of the animal functions succeeds to inordinate nervous excitement.*

In conclusion, allow me to state what I consider has been illustrated by the cases I have related in this paper. They show, 1st, That extensive lesions generally depend in part upon some morbid condition of the blood, existing either from alteration in its normal constitution, or from the presence of a morbid material. 2d, That such morbid conditions of the blood exercise an influence in modifying the elementary forms of organization of the exuded *liquor sanguinis*, the great tendency of which is to become organized in forms varying with the existing dyscrasia, and tending, least of all, to disintegrate or to involve the texture of the lung itself in death. 3d, That during the progress of typhus fever the exudation of *liquor sanguinis* in the lung assumes a low type of organization.

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* Guislain, Gaz. Med. 1838. No. xxviii.

4th, That contiguous tissue exercises an influence upon the elementary forms which the exuded products assume. 5th, That any amount of texture may be involved. 6th, That the intervesicular-filamentous tissue, as well as the pulmonary vesicles, are the seat of the exudation. 7th, That in gangrene of the lung every simple element of the pulmonary tissue is involved. 8th, A deposition of fat in the lung I have also attempted to explain; and, 9th, I have shown that it is a morbid condition by no means uncommon; that it is found in conditions of obstruction to the respiratory process, and that it continues to accumulate until disintegration of the exuded products and death of the pulmonary texture. 10th, That pulmonary gangrene, along with death of the exuded matter, is connected with, and influenced by, lesions in the nervous centres, by the dyscrasia existing during typhus fever, variola, and tuberculosis, by arterial obstruction, causing pressure upon the entire mass of the affected parts, and total absence of circulation in the part.

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1. Pavement epithelium from mucous membrane of smaller bronchia (after Lebert).

Fig. 2. Intermediate forms of epithelium, between the pavement, cylindrical, and vibratile (after Lebert).

Fig. 3. Valentin section from lung in Case 1. Compound granular corpuscles and granules amongst the fibres, and filling the air-cells; fibres unbroken.

Fig. 4. (*a*) Compound granular corpuscles; (*b*) colourless cells; (*c*) oil or fat; (*d*) blood discs and granular matter from fluid in the same lung.

Fig. 5. Pyoid corpuscles, colourless cells, and granules from fluid in lung of Case 2.

Fig. 6. Valentin section of same lung, showing fibrinous exudation and fibro-plastic cells, with pyoid and colourless corpuscles.

Fig. 7. Pus and oil globules from fluid of the grey part of lung in Case 3.

Fig. 8. Organized forms in fluid of the lung as it passes from red to grey. (*a*) Compound granular cell (few of them seen); (*b*) blood discs in masses; (*c*) colourless cells; (*d*) pus-corpuscles of the usual forms; (*e*) pus-corpuscles surrounded by a pellucid cell wall, within which the pus cells seem to float from side to side.

Fig. 9. Atheromatous deposit from the anterior tibial artery, composed of fat, crystals, and granules.

Plate II.

Fig. 1. Section of lung in Case 3, showing the pulmonary fibres separated very much, but not broken, intermingled with exuded matter, consisting of blood in masses, pus cells, oil globules and fat granules.

Fig. 2. Section from grey portion of same lung; no compound granular cells; every interspace filled with pus cells and oil; fibres much separated, but unbroken; no blood.

Fig. 3. Effect of acetic acid in bringing the vestiges of the form of air cells into view, showing the pus-corpuscles and granules, with the pulmonary fibres; no compound granular corpuscles.

Fig. 4. Exuded products in the form of the compound granular cell in passing from the grey to the red part.

Fig. 5. Appearances in Case 5; the more vascular part contained blood and imperfect cells, granular exudation, and fat.

Fig. 6. Granular exuded products, fat and oil drops in a section of the same.

Fg. 7. Exuded matter from gangrenous cavity in Case 7. (*a*) Oil globules and fatty granules; (*b*) pus-like cells; (*c*) blood discs; (*d*) compound granular cells, modified by the typhous dyscrasia. Broken-down fibres are interspersed.

Fig. 8. Contents of the millet-seed-shaped bodies, consisting of oil, compound granular masses, and pus cells, along with blood.

Fig. 9. The millet-seed-shaped bodies, the natural size, and magnified ten times.

Plate III.

Fig. 1. Valentin section from friable portion of lung surrounding the gangrenous cavity, in Case 7. Altered blood coloured the tissues; fibres unbroken; imperfectly-developed exuded material in masses modified by the typhous dyscrasia.

Fig. 2. Effect of acetic acid; cell-walls destroyed; appearances of fat and oil.

Fig. 3. Section of cartilage nodule in lung.

Fig. 4. Fluid from lung in Case 4. (*a*) Pus in various forms; (*b*) various forms of epithelium; (*c*) vibrions (?); (*d*) granules of fat.

Fig. 5. Effects of acetic acid on the same fluid.

Fig. 6. Vibriones (after Lebert).

W. A.

Note.—The microscopic observations were made with one of "Oberhausser's" microscopes ("Place Dauphine, 19, Paris"), and with a power of 250 or 300 diameters, unless otherwise mentioned.

ART. II.—*Observations on the Climate and Sanitary Condition of Taunton and its Neighbourhood, and on the Health of Towns.* By J. H. PEEBLES, M. D., Fellow of the Royal College of Physicians, and formerly Physician to the Royal Infirmary, Edinburgh, and Physician to the late British Factory at Leghorn.

IN drawing up the following observations, I have to regret, that, from the want of meteorological statistics, which I find have never been kept in that part of the country, I have not been able to give fuller information on the nature of the climate. My own observations are even less complete than they should have been, from the uncertainty of my residence, and other circumstances. These have only extended over a period of three years; but I still hope that some useful information is communicated on the subject.

I have given the mean temperature for three winter seasons, for Bristol, Taunton, and Torquay, with the highest and lowest degrees, and the respective ranges of the register thermometer for those places. These have been deduced from the register at the institution in Bristol, from that kept by myself in Taunton, and from tables published periodically at Torquay. I have also added some meteorological observations made by me at Taunton for the above period, and have availed myself of the work by Savage on the History of Taunton for information on the geography of that part of the country.

The statistics on the sanitary state of Taunton and its vicinity are taken chiefly from the records of mortality in the Registrar's office there, which I have examined with care. These include, besides the borough of Taunton, the adjoining union districts of Blagdon, Bishop's-Lydeard, and North-Curry. The nature of the diseases from which the mortality has arisen, must rest on the accuracy of the medical certificates in the respective registers; but these I have every reason to believe are correct.

CHELTENHAM, 10*th August* 1848.

The borough of Taunton is situated on the River Tone, whence it derives its name. It is a principal town in Somersetshire. It stands in the vale of Taunton-Deane, an extensive fertile district of country, consisting of larger and smaller hills and meadows. The soil is principally a rich loam. In some parts it is clayey, especially the sub-soil, as parts of Bradford, Buckland, the north side of Wellington, part of Stamford-hill, Farrance, Ninehead, Oak, and Heathfield; and in other parts it is sandy, gravelly, or of a lighter mould, as Kingston, Bishop's-Lydeard, Halze, Fitshead, Milverton, Longford, Thorn, Saint-Margaret, and Runnington. The dry uplands are appropriated to tillage, and the rich lowlands chiefly to grazing and the dairy, together with the cultivation of wheat, barley, and beans. The soil is very fertile, and may be made still more so by an improved mode of agriculture. The country abounds in villages, woods, orchards, and gardens. There is not much oak in the vale, but elm grows to a great size in the hedges throughout the country (vide Savage).

This picturesque country is surrounded by an amphitheatre of hills, being bounded on the north, west, and south by the Quantock, Brindon, and Blagdon hills. Towards the east and north-east it has no mountainous boundary until it reaches the Polden hills—a distance of twenty miles from Taunton. The River Tone, on which the town is situated, takes its rise at Biverton Bottom, under Brindon Hill. It is a shallow stream at Taunton, being only fit for barges. It is sluggish, except after heavy rains. It is not kept sufficiently clear of mud or soil, which often accumulates, especially near the bridge at Northtown, where the principal drains from the town terminate. The Tone unites itself with the River Parrett near Burrowbridge. The latter runs through Bridgewater, receives the Brent at Burnham, and soon thereafter falls into the Bristol Channel.

Thus situated on an extensive plain of rich fertile soil, generally of a light nature, and surrounded for the most part by the above-mentioned hills, and especially from its low geographical position in the island, Taunton may be said to enjoy a mild equable climate. In ordinary winters, the register-thermometer seldom indicates as low as the freezing point, and in severe seasons it shares a degree of cold not so great as Bristol, and not much different from what is experienced at Torquay. The following table (see next page) will show the comparative average difference betwixt those places for the winter seasons of 1844–45, 1845–46, and 1846–47.

It will be observed by examining this table, that the thermometer marked higher during the day at Taunton than at Torquay 12° in the above three seasons, or ⅔° per month, and 66° higher during the night at Torquay than at Taunton, or 2⅔° per month. It was higher during the day at Taunton than at Bristol 9°, or ½° per month; and higher in the night at Taunton than at Bristol also 9°, or ½° per month. It was higher during the day at Bristol than Torquay 2°, or ⅑° per month; and higher at Torquay than at Bristol during the night 65°, or 4° per month. The range, therefore, is less at Torquay than either at Bristol or Taunton, as follows:—

		Bristol.	Taunton.	Torquay.
In the winter of 1844–45,		32·4	32·1	28
... ... 1845–46,		31·2	29·5	25·2
... ... 1846–47,	(5 months, February wanting)	25·1	32·4	29·1

TABLE of Register Thermometer at Bristol, Taunton, and Torquay, for the Six Winter Months of 1844–45, 1845–46, and 1846–47.

	BRISTOL.					TAUNTON.					TORQUAY.				
	Mean of		Min.	Max.	Range.	Mean of		Min.	Max.	Range.	Mean of		Min.	Max.	Range.
	Min.	Max.				Min.	Max.				Min.	Max.			
1844–45.															
November, -	40·21	51·24	27	58	31	42·12	50·4	28	60	32	42·20	51·25	34	60	26
December, -	31·14	41·3	23	52	29	33·4	38·27	22	52	30	37·15	42·12	27	53	26
January, -	35·18	44·23	28	51	23	37·13	46·15	25	53	28	39·20	47·25	26	53	27
February, -	29·9	43·20	18	52	34	33·14	43·19	24	51	27	35·21	43·26	28	52	24
March, -	33·16	46·4	17	56	39	34·4	45·4	17	58	41	35·22	45·16	21	59	38
April, - -	41·13	61·2	32	72	40	42·9	59·5	2	67	35	43·8	55·18	36	63	27
1845–46.															
November, -	40·15	51·19	30	62	32	43·25	53·24	31	62	31	44·2	52·5	34	59	25
December, -	37·16	48·9	27	53	26	40·13	49·28	29	56	27	39·5	50·3	31	56	25
January, -	42·26	51·13	22	57	35	44·5	51·10	32	60	28	45·3	51·5	36	56	25
February, -	39	51·14	26	60	34	43·15	52·6	26	59	33	43·6	50·15	28	57	29
March, - -	37·5	51·21	27	60	33	39·19	53·3	28	60	32	42·6	51·13	42	58	16
April, - -	42·21	58·12	35	63	28	42·9	54·1	35	63	28	45·3	52·4	29	61	32
1846–47.															
November, -	41	51·2	29	62	33	40·15	52·22	27	60	33	45·2	52·6	29	64	35
December, -	32·5	42·18	27	51	24	33·15	42·15	23	53	30	34·3	41·10	26	53	27
January, -	33·25	41·8	29	48	19	37·13	45·16	30	57	27	36·6	42·4	30	53	23
February, -	wanting.		...	...	...	35·10	45·26	18	59	41	37·5	42·3	26	57	31
March, - -	40·20	51·3	29	61	32	37·16	49·22	21	56	35	40·6	49·9	30	59	29
April, - -	45·3	55·20	40	59	19	47·10	54·11	30	60	30	43·3	53·9	31	61	30

The register thermometer indicated at Taunton as low as the freezing point 98 times during the above three winters. But two of these winters were severer than usual, particularly the winters of 1844–45, when the thermometer descended to 32, 53 times, while in 1845–46, it was as low only 11 times. In 1846–47, it marked 43 times. At Bristol it indicated the freezing point in 1844–45, 103 times. In 1845–46, 16 times, and in 1846–47 (February wanting), 29 times; in all, 148 times *in* 17 *months.* At Torquay it marked as low as 32 in 1844–45, 32 times. In 1845–46, 7 times, and in 1846–47, 43 times, being in all 82 times during the three seasons.

Rain.—No record has been kept, so far as I know, of the barometer, or of the quantity of rain that has fallen at Taunton or in the surrounding districts. But it is believed to be less than in many other parts of the country. This may in some degree be ascribed to the clouds being attracted by the hills, particularly when the wind blows from the S. W. or N. W., the quarter from which the greatest quantity of rain proceeds, as is shown from the following statement. During the above three years, rain occurred on 363 days, viz. 71 days all day, and 292 part of the day, or showery. On 186 of these days, the wind was from the S. W.; on 67 days from the N. W; and on 23 from the W.—in all, 276 days. Rain fell on 67 days only when the wind blew from the north to south inclusive, and on 20 days when the wind was variable or calm,—being in all 363 days. In the above statement there should be included 15 nights in which rain fell, and 11 days early in the morning.

Snow fell on nineteen days, but it was generally in light showers, and it seldom remained on the ground above a few days. Hail occurred seven times only, and always with showery weather.

Humidity.—No hygrometrical observations have been made in that part of the country, but it is believed the atmosphere is less humid than in many other districts. Evaporation is observed to proceed rapidly after rain. This may be owing partly to the absorbent nature of many parts of the soil, and from less rain falling in the vale, and likewise from the great proportion of days with sunshine. I have stated above the limited number of days on which rain fell. The following statement will show the proportion of days of sunshine, of those with fair weather without sunshine, and on which rain fell, also the number of days with drizzle or snow during three years:—

With sunshine, uninterrupted, . .	353 days.
Do. alternating with clouds and mists,	188 ...
Do. with rain part of the day, or with showers, . .	190 ...
Without sunshine, but with rain or showers,	102 ...

Fair, but cloudy or hazy, and without sunshine,	159	days.
Rain all day, . . .	71	...
Drizzle, ...	7	...
Snow showers fell on, . . .	19	...
	1089	...
Wanting,	6	...
	1095	...

From which it will be observed that there were 731 days with more or less of sunshine, 353 or more than one-half, the whole day; and from the number of fair days without sunshine, and the small proportion in which there was falling weather the whole day —being only 71—it seldom happened that a day passed without sunshine or dry weather.

The drizzle, which is so frequent in Devonshire and Cornwall, it will be seen, is but little known in the Vale of Taunton, having only occurred seven times in three years, and on three of these on a part of the day. Fogs also appeared seldom, being on nine whole days, and sixteen in the morning or early part of the day. These happened in the months of October, November, December, January, and February each year,—occurring only four times in July and August. Light misty or hazy weather was observed only on fifty-three days the whole day, and on thirty part of the day. On these days the wind blew from the N.E. to the S.E. inclusive, fifty days, and from the south to the north inclusive, 25 days. On the remaining eight days, the wind was variable, or the weather calm.

Thunder is rare in the vale, having been heard only on six days distant and on six near.

Storms are also unfrequent. They occurred only on forty-nine days all day, and on eight a part of the day—in all, fifty-seven, or about nineteen annually. Forty-eight of these happened in the months of January, March, April, June, July, October, and November in the three united years; and of the remaining ten, three occurred in February, four in September, and one in each of the months of May, August, and December. These happened when the wind blew from the S.W. on forty-five days; from the N.W. on fourteen; from the west on six; from the N.E. on three; from the south and S.E. on two each; from the north and east on one each; and one when variable.

During three years, also, the wind was observed to blow—

From the	South-west on	292	days.
...	North-west ...	280	...
...	North-east ...	164	...
...	South-east ...	83	...

From the East	on	74 days.
... North	...	39 ...
... West	...	62 ...
... South	...	20 ...
Calm, 43, variable 32,		75 ...
		1089 ...

Reckoning from the N.W. to the east inclusive, the wind blew	557 days.
From the S.E. to the west inclusive, .	457 ...
When calm or variable, . .	75 ...
	1089 ...

It will be thus observed that, in any one direction the southerly winds prevailed, but the northerly and easterly *generally* predominated. The latter, however, were of a subdued character, and seldom accompanied by rain or fog. We notice, also, that rain and showers fell when the wind blew from the S.E. on 251 days, and when from the N.W. to east inclusive, on ninety-two days; the remaining twenty days being variable or calm.

The spring is variable, like in other parts of England; but, as above remarked, the east winds are of moderate force, and but seldom charged with rain or fog.

The summer is occasionally hot, but seldom oppressive;—the heat being moderated by refreshing breezes, which perflate the vale. During three summers, the thermometer marked from 70 to 80 inclusive, only on sixty-two days; and from 81 to 84, also inclusive, the small number of twenty-one days; the average highest temperature for the three seasons being—

For the summer months of 1845.—	June,	73·25.
... ...	July,	72·3.
... ...	August,	67·5.
... ... 1846.—	June,	77·13.
... ...	July,	71·1.
... ...	August,	71·9.
... ... 1847.—	June,	68.
... ...	July,	73·16.
... ...	August,	70·26.

The autumn is very pleasant, and of an agreeable temperature.

The borough of Taunton has a favourable aspect. It covers a considerable space in proportion to the population. It is about a mile in length. The principal streets are open and wide. There is a spacious market-place in the centre of the town; and, for the most part, there is sufficient declivity for drainage; but many parts near the river are low and flat. The lanes and courts which run back from the streets are generally close and crowded. Ashpits, pigsties, and necessaries abound, with cesspools, gulley-holes, and imperfect drainage. In many places, also, in and near the town, there are open and extended ditches containing offensive impurities, which are often stagnant from deficiency of water and of sufficient declivity to carry them forward, and are thus constantly emitting their fetid and unwholsome effluvia all around. The houses of the poorer classes in these districts are also commonly badly constructed for health and comfort.

It is in such localities, and under such circumstances, that are commonly found the proximate and remote causes of many disorders and physical derangements which afflict the inhabitants, from the local malaria which is generated within and near their dwellings.

How far the sanitary condition of Taunton is influenced by these local causes I shall now proceed to consider.

The population of Taunton, including the extended borough, amounted, according to the last census in 1841, to 12,071 inhabitants; and allowing for some increase since that time, it may now be estimated to be about 12,800. In examining the register of deaths from the beginning of 1843 to 1846, we find the mortality, excluding deaths from accidents and those in the Union Workhouse,—the subjects of which had been admitted from the country districts,—amount to 882, or about 294 annually; being 1 in 43½ of the whole population. Of these, there are 319 deaths of children under five years of age; being about 1 in 2¾, or nearly 37 per cent of all the deaths. In the mortality of adults, there are 149 deaths from pulmonary consumption; being 1 in 5¾ of the other deaths. There are 36 from fever, or 12 annually. 27 deaths from apoplexy and paralysis, or 1 in 33. From diseases of the heart 35, or 1 in 15. From inflammation of the pulmonary organs, 30; of the brain, 5; of the abdominal viscera and membranes, 17; being 52 from inflammation of various organs. There are 47 deaths from dropsical affections, proceeding generally from visceral disease. From disease of liver and jaundice, 15; from various other diseases, 92; and from old age, 95; being, in all, 563 deaths of adults.

The mortality of children under five years, arose from convulsions, 49 deaths; from measles, 30; inflammation of the lungs, 29; bronchitis, 18; hooping-cough, 30; atrophy, 29; phthisis, 15; inflammation of bowels, 15; fever, 10; diarrhœa, 7; hydrocephalus, 7; and from other discases, 80,—being in all, 319.

In examining the register of deaths for the Blagdon Union district of ten parishes, containing 5000 inhabitants,—also from 1843 to 1846,—the mortality will be found to amount to 270, or 90 annually, being about 1 in 55½ of the population, or 12 in favour of this district over Taunton. In the division of Bishop's-Lydeard, of nine parishes, with 4000 inhabitants, the deaths were

189, or 63 annually, being as low as 1 in 63½, or 20 above Taunton. The difference is still more remarkable in the North-Curry district, which contains a population of 7000, from 1839 to 1842 being the last three years recorded in the Register Office in Taunton for that part of the union, there are 306 deaths, or 102 annually, being in the proportion of only 1 in 68, or 24½ in favour of this district.

It is proper here to observe that the deaths which happened in the Workhouse during the above periods, the subjects of which came from those parts of the country, are included in the rate of mortality for the respective districts. These amount to 21 for the Blagdon division, 23 for that of Bishop's-Lydeard, and to 22 for North-Curry. All these country districts are therefore more salubrious than Taunton, particularly for the health of children. The deaths of these under five years amount in the Blagdon district to 1 in 3¼ of the whole mortality; in that of North-Curry to 1 in 3⅓; and in Bishop's-Lydeard district as low as 1 in 5¾; while in Taunton they are, as already stated, as high as 1 in 2¾ of the other deaths.

The deaths from pulmonary consumption in the Blagdon district amount to 1 in 7½; in that of Bishop's-Lydeard they are only 1 in 10½. But in the North-Curry division the proportion is very high, being 1 in 4¾; and this is the more remarkable, considering the low rate of mortality in general in this part of the country, as stated above. This difference of mortality in these districts arises much from their respective aspects, and other local circumstances. Thus the greater part of the Blagdon division is more exposed to the north-east winds, particularly the parishes of Church-Staunton and Pitminster, which contain more than half of the population of the whole district. The former of these is also situated on the Blagdon hills, and is not only more exposed, but colder in winter, and more rainy, and in many parts boggy.

The latter parish is in general badly drained, and stagnant refuse is abundant near many of the houses of the lower classes. Hence diseases of the pulmonary organs are more frequent, and fever is also found to be endemic in some localities. The extensive district of North-Curry, although, as stated above, so remarkably favourable for the health of the inhabitants in general, is in some parts low, damp, and swampy, inducing inflammatory disorders and affections of the pulmonary organs; hence the greater fatality of these diseases, and their greater prevalence in this division than in any other of the districts—even including Taunton.

Longevity, to which that part of the country is so favourable, is also less in the latter district than in Taunton, or in the other divisions. Thus, in Taunton, the deaths above 70 years of age are 1 in 4¾, nearly 1 in 2¾ of these being above 80. In the Blagdon district they are in the proportion of 1 in 3½, above 70 years to the other deaths, one-half being above 80. In that of Bishop's-Lydeard they are nearly 1 in 2¾, half of these being also above 80. But in the North-Curry division they amount only to 1 in 5½, of these 1 in 2⅛ being above 80 years.

In comparing the sanitary condition of Taunton with that of the adjoining districts, we observe a considerable difference in favour of the latter.

This more unhealthy state of the former may be attributed much to those local circumstances, mentioned above, as existing in many parts of the town, where the physical powers and general health of parents in these localities often become imperceptibly and gradually deteriorated, particularly after they have been for some time resident there. Hence, the constitutions of their offspring are often weakly, and they are more susceptible thereby of diseases of a certain character, which are commonly in such cases more fatal in their consequences.

Accordingly, in examining the statistics of the diseases which have caused the greatest number of deaths, we find they are such as we may expect to arise from this condition of constitution. Thus the deaths from convulsions and atrophy are as high as 78, and from pulmonary diseases 68,—being in all about 2¼ of the whole deaths of children in Taunton. And again, we find that those members of such families who live to the age of puberty are very liable after, or even before, that period, to be attacked with pulmonary consumption; the number of deaths from which, we have seen, amount to 149 of adults; and adding 38 deaths from other affections of the lungs, they constitute one-third of the whole mortality,—thus showing the great extent of the scrofulous habit. But we have also observed, that even in some parts of the country districts, particularly in that of North-Curry, there are local circumstances which occasion a greater proportion of deaths than usual from pulmonary diseases, even than those in Taunton. This unhealthy state of constitution may also arise from other causes, such as deficient or improper nourishment, the abuse of stimulating liquors, over-fatigue of body, defective clothing, and anxiety of mind, from which the lower classes are so apt to suffer; but it does not appear that these causes exist to a greater extent in Taunton than in the neighbouring districts, the statistics of which show a much lower rate of mortality. This consumptive tendency is also to be attributed to the peculiar character of the climate itself, which, although possessing the favourable qualities mentioned above, is to be considered as relaxing and debilitating to many constitutions, affecting particularly the digestive organs and the nervous system, especially of those individuals who are naturally less robust, or have acquired this unhealthy condition from a lengthened residence in those parts of the country. The climate may be less relaxing than that of Cornwall, or the south coast of Devonshire, yet it is decidedly of that peculiar character. It may be considered as well adapted for individuals of a plethoric habit, and who are predisposed to inflammatory diseases; and, as already observed, it is very favourable to persons advanced in life. From the mildness, equability, and dryness of the atmosphere, which is of a less irritating nature, it is well suited for certain affections of the pulmonary organs, particularly of the dry catarrhal kind. Some of the localities in the neighbourhood, especially Bishop's-Lydeard, are very favourable, from their sheltered situation and dry gravelly soil.

In examining the mortality of other rural towns, we find in some of them it is much higher, depending much on local causes. Thus, Gloucester, with a population of 15,000 inhabitants (see Mr Slaney's Report to the Royal Commissioners), having a fine situation in the vale of the Severn, and well placed for drainage, is in a very unhealthy condition, the mortality being as high as 1 in 35. This is greatly owing to the neglected state of the city; the most crowded parts having receptacles of filth and refuse of all kinds, most injurious to health. Mr Slaney also states, that in Droitwitch, Wellington in Shropshire, and other smaller towns, great neglect of sanitary regulations prevails, to the injury of the inhabitants.

Captain Denison, in his Report on Salisbury, states that a greater mortality is found there than in many other places, being as high as 1 in 38, owing to the low damp situation of the town in the midst of water, meadows, and from the miserable state of the dwellings of the lower classes, their poverty and wretched condition, and the filthy state of the courts and alleys where these classes generally reside, which are little more than the generators of atmospheric impurities. I refer particularly to the reports of these gentlemen, as bearing specially on the effects of external vitiated air proceeding from local causes in towns, and low, damp, marshy, badly-drained situations in the country, in increasing the mortality of the places mentioned, which, from other local advantages, should be among the most healthy in this country.

We have observed that the cases of fever in Taunton are not numerous compared with the population, and the local circumstances formerly stated. But we are not to judge of the nature of the atmosphere from the number of cases which may occasionally appear, as much will depend on the physical condition of those families who are resident in these localities. Many individuals, who are naturally robust, or whose constitutions have not been previously impaired by destitution, intemperance, or other causes, may resist for a long time the influence of the local miasm; while such as are either of a feeble constitution naturally, or who have suffered from the causes mentioned above, become more readily affected. This is common to all malaria districts,—

the peculiar fever depending greatly for its development on the condition of the individuals exposed to the influence of the local atmosphere, and the length of residence in the locality. But, as already stated, the general health, especially the nervous system and digestive organs, may become gradually impaired and deranged without fever being induced, affecting the health of their offspring, and even shortening the period of their own existence, and thereby increasing the rate of mortality.

In comparing the mortality of other towns with each other, and of these with Taunton, we find a considerable difference. Thus, in Liverpool and Manchester, the deaths are as numerous as 1 in 29 and 30 respectively; in Bristol, they are about 1 in 37; in the east and south divisions of London, they are 1 in 37 in the former, and 1 in 39 in the latter; and in Birmingham and Leeds they are 1 in 38. The greater rate of mortality in these crowded towns and districts is readily accounted for on the above principles, and chiefly from the great proportion of the lower classes, and from these being so densely crowded together in close, badly-ventilated rooms and cellars, and from other accessory causes. It is under such circumstances that the physical powers become impaired, and much disease is produced, and particularly contagious typhus fever, which is often so fatal, and is the cause of so much destitution and misery, by carrying off many male heads of families, thus leaving their families destitute and unprotected. I had opportunities of confirming this fact, when acting as physician to the fever department of the Royal Infirmary of Edinburgh. Mr Chadwick has calculated that about 27,000 cases of widowhood and 100,000 of orphanage occur in England from preventable causes, of which we may consider this disease as the principal.

In Observations which I published in the 44th volume of the Edinburgh Medical and Surgical Journal (1835), to which I refer, I pointed out the peculiar characters of this specific fever, and the source from which it arises: that it is produced by the congregating of many individuals in confined sleeping-rooms without a renewal of the fresh air, whereby the atmosphere becomes so vitiated from being so often respired; that a poison *sui generis* is generated in the human system, which produces this specific fever; and it is in such localities, and under such circumstances, that this disease is propagated as from a centre.

In Edinburgh, the lower orders, of Irish particularly, are often found so crowded together, that from fourteen to sixteen individuals occupy one small sleeping-room of twelve feet square; this apartment being used for ordinary purposes during the day, when the bedding is put aside in the same place, to be used again at night. It is not surprising that in such localities this fever should be found to develope itself; and this will always be the case wherever these crowded places are situated; for it is not necessary that they be in densely-populous towns, although they are commonly found there; for the fever may occur under such circumstances in the country or on board of ship, and I have seen it in the highest places of the lofty houses in Edinburgh; and it may arise when the inmates are not suffering from want or destitution, and have been previously enjoying good health; although it is to be admitted that the disease will be propagated more rapidly in those localities where poverty and other accessory causes are present, for the destitute are obliged to resort to such dwellings, and frequently in great numbers, and are not only more susceptible of the disease, but the fever will be found to assume in their cases a more malignant character. Sporadic cases occur occasionally, taking an epidemic form at certain periods. One reason of this temporary suspension appears to be, that it commonly attacks the same individual only once, instances to the contrary being exceptions to the general rule. Certain atmospheric influences also favour the extension of the fever. In these and other respects it resembles eruptive contagious diseases, to which class I have considered it properly to belong. Another reason of its recurrence being periodical is, that young children are but seldom attacked with it, and when they are, the disease is always of a mild character; and as those advance in life, they become liable, along with such as had previously escaped the infection, to take the disease on its appearing again in an epidemic form. Another circumstance which favours the rise and propagation of this fever is *famine*. This will not of itself produce the disease, but by bringing the lower classes in crowds together in such distressing circumstances, it will thus contribute to the generation and extension of the disorder. It is also observed that this specific fever is most general and fatal in the winter season, while the fever arising from external miasm is most prevalent in summer and autumn. This will be accounted for on the above principles.

The rate of mortality in Bath, Coventry, Wolverhampton, and Worcester, is rather higher than that of Taunton, being 1 in 40 respectively, these towns containing a larger proportion of the lower orders. Again, in the north and west divisions of London, —in Plymouth and York,—the deaths are much the same as in Taunton, but in other rural towns they are not so great. Thus, in Cheltenham, they are 1 in 45; in Oxford, 1 in 48; Winchester, 1 in 49; Windsor, 1 in 52; Penzance, 1 in 53; and Dorchester, 1 in 54; owing to the more favourable circumstances in which these towns are placed.

In comparing the mortality of different towns, it is of importance, as has been observed, to take into consideration the situation of the town, its aspect, declivity, drainage, nature of the soil, peculiarities of the climate, the proportion of the lower classes to the middle and upper ranks of society, the internal as well as external condition of the dwellings of the former class, their mode of living, and moral habits.

The public are now called upon to rectify the accumulated moral and physical evils which so deeply afflict a great proportion of the human race, by adopting an efficient system of drainage, attention to cleanliness, a speedy removal of all refuse, an ample supply of water, the erection of comfortable dwellings in well-aired, dry situations, avoiding as much as possible low, damp localities, which have been found to be injurious to health both in town and country. Such houses ought to be constructed of larger dimensions, with sleeping-apartments for both sexes, as it is well known that, in the present dwellings of the poor, the same bed-room is indiscriminately occupied by both sexes; and it has been stated on authority, that comfortable healthy houses may be erected for the working-classes at a cost even less than is paid for the squalid tenements they now occupy. Proper ventilation is also to be attended to; for, besides the risk of generating contagious fever in close-confined bed-rooms, as already stated, we have abundant proof of the baneful effects of the deficiency of fresh air in badly-ventilated, over-crowded factories and school-rooms even during the day, particularly on the health of children when long confined in such localities, producing listlessness, languor, depression of spirits, and incapacity of mental application, and ultimately the constitution becoming seriously affected.

While we endeavour thus to improve the condition of the lower classes, it is also necessary to provide for them the means of existence, by procuring such employment for the able-bodied and healthy as will afford an adequate suport for themselves and their families; for it is manifest, when the physical powers are reduced by destitution to the lowest state of misery, there is not only an indifference to moral action, but the feelings become depraved, and immorality and crime from recklessness too readily follow. In such distressing circumstances, when man is sunk into the lowest state of degradation, the general principles of Christianity are found to be ineffectual in restraining the profane and vicious, and in effecting the great work of moral renovation; for to insure success to this Holy Agency, it must be applied through the moral constitution—the physical and mental faculties. But when these are depraved, and when want has produced misery and wretchedness, the best-directed efforts to reform the social condition will be found to be of little avail.

Man must first be raised from the painful degradation into which he has thus fallen, and be restored to that state of comfort which he formerly enjoyed. This moral disease penetrates deeper into life than can be well conceived. It saddens the hearts of thousands who, once happy and useful members of society, are now lost in the depths of darkness and despair.

But this great evil should be considered as national, and the preservation of the public health and morals not only as an act of humanity and Christian charity, but one specially of public economy; for, without taking into account the loss of labour, which must be very great, we are to look to the heavy expenses incurred during sickness, the consequences of numerous deaths, involving the support of so many widows and orphans, who must fall on the public, either on the parish or on private charity; and, lastly, the immense cost to the country for the maintenance, the prosecution, and punishment of criminals.

Under these circumstances it will be evident that, by carrying out these improvements, not only will a great saving be effected to the public; but that, by affording sufficient employment, suitable education and religious. instruction, and the suppression of many of the public houses and beer-shops,—those great sources of moral and physical corruption and ruin,—a vast change would speedily be apparent in the well-being and happiness of the great mass of the people; for we cannot admit that moral or physical degradation, with all its humiliating and distressing consequences, belongs to any class of society; as it is well known that the most exalted state of moral feeling and courage is to be found amongst the poorest of our race, unless the faculties have become, by long-continued hardship and misery, incapable of sustaining the moral energy.

By thus devising and carrying into effect this system of reformation and improvement among the lost orders of the lower classes, man would be seen to emerge from this depraved and neglected state, and to rise to that condition originally destined for him by his all-wise and merciful Creator.

ART. III.—*The Brain the Sole Centre of the Human Nervous System.* By EDWIN LEE, Member of several of the principal European Medical and Chirurgical Societies. (Read before the Royal Society, May 1848).

THIS paper was written for the Royal Medical and Chirurgical Society, the subject appearing to the author one eminently calculated to elicit useful and interesting discussion upon points of great practical importance. The committee, however, thought proper to decide that the paper was inadmissible; it was therefore offered to the Royal Society.

The following brief considerations are submitted to the Society in consequence of the opinion which I have always entertained, that the inferences which have been deduced from experiments upon the inferior animals are less applicable than has been supposed to man and the higher mammalia, in whom different anatomical and physiological conditions are seen to prevail. That this is a point the decision of which is of great practical importance, is sufficiently obvious; and having already expressed these opinions in a work, of which a new edition is preparing, I am desirous of previously having the subject discussed in the Society, in order if possible to meet any objections that may be advanced against it and the corroborative opinions which I shall adduce.

It is well known that in the lowest class of the animal creation, vitality is pretty equally diffused, so that subdivision does not occasion destruction of life; and this is also the case somewhat higher in the scale, where the rudiments of a distinct nervous system are perceptible, as in the tape-worm. In proportion, however, as we ascend to the more perfect animals, the vital powers tend to become more centralized and dependent upon the integrity of particular organs. Thus, in reptiles and frogs, which possess a brain and heart, though the vital phenomena may continue to be manifested after the destruction of these organs, this will be but for a short time, and the prolonged continuance of life is impossible. The more complete dependance of life in the higher animals, upon these organs, need not here be dwelt upon; even slight lesion of them being mostly destructive.

From the two great divisions of structural difference in the nervous system,—viz. the granular or vesicular grey substance, and the fibrous white matter,—the difference of function has been inferred with every appearance of truth, both from experiments and from pathological observations, viz. the former being more immediately connected with the generation of nervous power; the latter serving solely for its conduction. In inferior animals, where the brain forms but a small portion of the nervous system, re-active effects may be produced by stimulation for a longer or shorter period after its removal; this organ being, however, necessary in all cases in originating actions, and in the perception of sensations. But in the higher mammalia, and especially in man, where the grey matter is for the most part agglomerated in the brain, being but in very minute proportions elsewhere (the spinal cord or the ganglia), these reactive effects do not take place, or very speedily cease, when the influence of this organ is no longer exerted; and, consequently, the inferences which have been drawn from observation of phenomena manifested in animals in which a totally different condition of the nervous system exists, do not appear to me to be confirmed by the arguments, which have been brought forward in proof of the independence of separate portions of the human nervous system. Bichat, as is well known, considered the sympathetic as constituting a distinct system from the cerebro-spinal, and each individual ganglion as a central focus of organic life, analogous to the great and only centre of animal life, the brain. He also considered that each nerve was in great measure independent of the ganglion whence it proceeded; and even that each portion of such nerve was independent of the rest, forming in itself a distinct focus of nervous influence. Kolliker, likewise, in common with some other modern physiologists, has recently advocated the opinion that each isolated ganglion, with its connected nerves, is the seat of a special activity constituting a simple functional whole; but this view does not seem to be in accordance with physiological and pathological facts; and the opinion of Galen, by whom, says Mr Solly, in his work on the Brain, the ganglions of the sympathetic nerves were supposed to act as buttresses in order to strengthen them as they recede from their reputed origin, seems to me to approach nearer to the truth. Willis also regarded the ganglionic nerves as an appendage to the cerebro-spinal system; and on viewing the question in its more comprehensive aspect, most persons would, I think, arrive at the conclusion, that, at least in man, these separate portions are essentially dependent upon the brain for the accurate performance of their functions. Mr Longet remarks, with reference to the supposed independence of the sympathetic,—"Facts are far from confirming the opinion, that each sympathetic ganglion is to be considered as a small centre acting independently of the cerebro-spinal axis. The acts of sensibility and contractility termed organic are but very imperfectly manifested, when the nerves of the cerebro-spinal system which converge to their ganglia, have been cut. The imperfect movements which persist for a certain time, take place even after the section of the nerves which arise from the ganglia, to be distributed to the viscera, as the heart and intestines, and last *until the entire exhaustion of the power diffused in the minute nervous fibrils.*" This position is well exemplified by the observation of Henle, which has been verified by Kolliker, that in rabbits, dogs, and horses, a fresh piece of intestine cut off close to the mesentery, and chemically or mechanically irritated, contracts only circularly at the irritated points. If, however, the mesentery with its nerves and ganglia be taken out with the intestine, and the part be then irritated, the contraction extends at the same time over a greater space; and if the nerves of the intestine are allowed to remain united to the spinal cord, the movement extends over the whole alimentary canal.

Professor Muller likewise observes upon this question,—"The moveable parts supplied by the sympathetic (heart and bowels) are, to a certain extent, independent of the brain and spinal cord. These organs must, however, also be regarded as the source of the functions of the sympathetic, *if its power is not to be exhausted.*"* "It is well known that the action of the heart varies from passion, and torpor of the abdominal viscera ensues on paralysis of the cord." "From these facts we may infer, that the sympathetic is charged from the central parts of the nervous system as sources of the nervous principle, and that being once laden it retains its charge, continuing to resist nervous power, even when the more distant supply is suspended, and is renewed only after a time. If, however, the brain and cord lose the capability of being the source of the nervous principle, exhaustion ensues, whence the debility and scarcely-perceptible pulse at the close of acute diseases."

Hence may be seen the reason of the uninterrupted persistence of the organic functions during sleep, as also why impressions made upon internal organs are so seldom transmitted to the sensorium. "This system," says another French physiologist, "specially consecrated to the nutritive and visceral functions, is but seldom affected by exterior impressions. It is acted upon by organs upon which it reacts, but this takes place quietly and obscurely. This depends upon the weakness of the conducting property. The ganglia of this system disseminated along its course impede the too free communications; and thus violent commotions of the cerebro-spinal system (the passions, &c.) are requisite for the influence to be propagated to, and to affect the sympathetic; and very sudden and intense disorder of the viscera must occur before their sensations can be transmitted to the percipient organ. It would appear that each ganglion constitutes a particular focus or centre, in which the operations, of a purely local innervation, are arrested and perfected. From this results the advantage, that the quiet and equilibrium of the vegetative functions are more easily preserved, less oscillation is to be apprehended, and there is more stability and continuity in the functional phenomena."†

The same arguments against the non-independence of the sympathetic, apply with equal force to that of the spinal cord, and consequently to the theory of Dr M. Hall; according to which, certain muscular movements termed reflex, depend upon a particular class of nerves, of which the spinal cord is the central organ, and which are independent of the brain; these movements, in experiments upon animals, not being producible when the spinal cord is removed. In contending for the originality of his views, Dr Hall says;—"Has it been stated in any work, ancient or modern, that the deglutition of water by the pharynx, the exclusion of carbonic acid by the larynx, the retention of the urine or fæces by the sphincters, are *exclusively functions of the spinal marrow, and of a peculiar system of excitor and motor nerves, of which it is the centre and axis?*" It may be true that this view had not been previously taken by others, and, as I think, with reason; for, upon a closer investigation, it will be found that the influence of the brain is exerted in these actions, though it may not be so clearly manifested as in the case of the more strictly voluntary movements. To take, as an illustration, the act of deglutition;—according to Dr M. Hall, the prehension of food is a voluntary action, and cannot be performed without the concurrence of the brain; but the contraction of the fauces and pharynx upon the morsel is a reflex action, and swallowing may take place even after the brain has been removed. The *sphincter ani* remaining contracted after decapitation, in one of the lower animals, the lower portion of the spinal cord being uninjured, but becoming relaxed when this portion is destroyed, affords another illustration of the reflex theory. In making these deductions, however, it would seem that the distinction has not been sufficiently kept in view between the results of these experiments, and those which would ensue upon analogous ones being made upon animals higher in the scale of creation, in which, as has been already observed, the portions of the nervous system tend more to a common centre; and in the higher mammalia, the inability to produce muscular reactions after removal of the brain, and especially after decapitation, clearly evidences the dependence of the use of the nervous system upon this organ. If a morsel of food could be placed in the pharynx of one of this class immediately after removal of the brain, there it would remain.

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* The italics are mine.—E. L.

† Duges, Physiologie Comparée.

"It results from the preceding observations," says M. Duges, "that the cerebral lobes are the chief centres of innervation, and that the spinal cord is rather destined to conduct than to elaborate the impressions and mental determinations; it is, however, not incapable of all action of centrality, if the term may be allowed; and this action will be so much the more apparent and easily produced in proportion as the preponderance of the brain is less, and as the spinal cord presents a greater analogy with the anterior ganglia of the invertebrata. This analogy is seen in the tubercles near the origin of nerves in serpents and lizards, the tail of which, when separated from the body, moves actively; and the decapitation of a turtle, of a lizard, a serpent, or of a frog, still admits of life being prolonged in the mutilated body for several days; the animal is agitated, draws up its limbs when pinched, leaps or moves when strongly excited. Legallois observed similar effects in young decapitated rabbits, in which the circulation was artificially kept up after ligature of the carotids. Analogous phenomena have been observed in the anencephalous fœtus. Birds hold in this respect an intermediate position between the mammalia and reptiles."

In the former editions of my work on nervous disorders, before having had cognizance of the works whence the preceding extracts are taken, I expressed my opinion as opposed to the theory of the independent action of the spinal cord, as also of its isolated portions, which some have deduced from the phenomena occurring after its section in the inferior animals, in these terms; viz. "that the nervous power *retained in the spinal cord for the immediate actions of the parts which it supplies* must soon be exhausted if communication be cut off from the source of nervous energy." This view of the question, I have since perceived, is the one taken by some distinguished physiologists, to whose opinions I will briefly advert.

It has been ascertained that nerves do not terminate, as was formerly supposed, in the parts which they supply, but are reflected in loopings, and that the filaments of which a nerve is composed, though bound together in the same sheath, yet pass separately into the spinal cord, and, according to some physiologists (Valentin), on to the brain, forming loopings also in the cerebral hemispheres, coming in contact in their passage along the cord with its grey matter; and this view appears to be corroborated by the phenomena of disease. Muller remarks that "the existence of distinct paralysis of sensation and of motion goes to prove that the sensitive and motor filaments pass up separately to the brain;" and again, "we must also consider that it depends upon the brain how many muscles of the trunk are to be moved in each action; whence it would seem to be a necessary deduction, that the primitive fibrils of the nervous trunks which enter into the cord do not there unite, but run parallel with each other to the brain, in order to convey to it local sensations, and to receive from it isolated excitations for the movements of parts."

On the other hand, Sir C. Bell, Mr Grainger, and Dr M. Hall, distinguished in the anterior as well as in the posterior roots of the spinal nerves, filaments passing directly into, and terminating in, the grey matter, the others proceeding directly to the brain; and Stilling has more recently given in his work a representation of longitudinal and transverse fibres ending in the cord. Professor Carus, however, referring to these contradictory opinions, observes that, although these nervous filaments do intertwine in a complex manner with the grey matter while in the cord, yet that their true terminal loopings are in the brain. "The spinal cord," he adds, "must therefore be considered as the common trunk of all the nerves of the body, and differs from a nerve only in the circumstance of the considerable admixture of grey substance. My investigations accord with those of Valentin; those of the other physiologists do not take account of the nervous loopings, and are not founded upon such accurate microscopic observations."

"As the radii of the globes converge towards a centre, and as gravitation attracts bodies in this direction, so in like manner do the primitive filaments of the nerves of the spinal cord converge to the brain, in order there, and there only, to form their internal or central loopings, the external or peripheric ones being diffused throughout the organism. The same distinguished physiologist further observes, with reference to the reflex actions,—"herein nothing more takes place in the central nervous system than what so commonly and universally occurs in the sympathetic system, viz. that the stream of sensitive innervation in the nervous filaments, instead of proceeding from the peripheric loopings direct to the central loopings, passes in its course through grey substance, in which sensation is concentrated, and, by reacting, produces muscular contractions.

"Thus we may readily perceive the reason why, wherever grey matter is in intimate contact with nervous filaments, the transmission of innervation in the latter must be modified; and it cannot be otherwise than that, by such intermediate operation, the action of the central grey masses on the primitive filaments will necessarily be to a certain extent lessened or altered. We see that in proportion as nervous filaments pass through a greater quantity of grey matter, so much the more must their sensitive as well as their reacting powers be obscured. The nerves of the lower extremity consequently produce more obtuse sensations, and less rapidity and delicacy of movement, than those of the upper extremities, and especially of the head, or those which are concerned in speech; for it is clear that the former pass through very much more not central grey matter than the latter. Thus the nerves of the three higher senses manifest an extraordinary peculiar power, inasmuch as the course between their periphery and the central vesicular mass is short and direct, without passing through any intermediate grey matter. The ganglia of the posterior roots of the spinal nerves likewise serve to check a too powerful stream of sensitive innervation."

The following passage confirms the views already expressed relative to the sympathetic ganglia:—"The nerves of the sympathetic follow throughout the same law as those of the cerebral system; and it is because their filaments pass through one or more masses of grey substance before reaching the brain, that the sensations transmitted to this organ, as also its reactions are more obscure. Hence, vegetative life pursues undisturbed its peculiar course. When sensations and reactive movements are necessary for vegetative life, they are found to be everywhere supplied through the medium of the sympathetic without the higher powers of the central system being drawn into direct co-operation, and consequently the actions of organic life become perceptible to consciousness only under certain circumstances (such as increased activity of the organs, the alterations produced by disease), and are felt so much the more powerfully from their being unusual. Hence, on the other hand, the influence of the mind upon vegetative life is so considerable, and thus we may properly estimate the opening and closing of the sphincters, the peristaltic movements of the intestines, that of the absorbents, &c. which always require the unconscious co-operation of the cerebro-spinal nerves.

"The nervous system in general, and the central portion especially, can only be considered as a whole, which, originally small and simple, becomes afterwards larger and more complicated. To entertain the idea of a nervous system as existing piecemeal, and subsequently uniting into a whole, would be much the same as if one were to imagine that, in our bodies, the trunk and extremities existed separately, and afterwards grew together. It is highly interesting, with reference to this point, to take a glance at animal life. The brain is small in proportion as the spinal cord is large. The more grey substance there is in the cord, the less there are of primitive filaments, so much the more will these reflex actions be manifested. If the body of an eel be cut into four portions, each one will move for a long period upon any slight excitation; whereas the decapitated trunk of an adult mammal immediately lies still, or exhibits contractions only upon irritating the cord itself. On this account, also, the reflex movements are so much the more strongly manifested in proportion as the animal is young, because the grey matter preponderates in the cord. In the fœtus, the sympathetic nerve, and especially the chief ganglia, are proportionally large."*

These opinions are corroborated by the high authority of Professor Cruveilhier, who says,—"The independence of different portions of the spinal cord of one another; the independence of the cord itself of the brain, which has been pretty generally admitted of late,—seems to me to be a serious physiological error, founded upon ingenious experiments. The theory of the ancients, who looked upon the spinal marrow as a great bundle of nerves destined to respond to all the nerves of the economy, in order to transmit definitively these impressions to the brain, or to receive from it the voluntary or organic impulses, is much more in accordance with facts and with the great anatomical law of the continuity of the nervous system."

MM. Foville and Pinel Grandchamp remark that, "As numerous observations demonstrate, that diseases of the cerebrum and cerebellum, co-existing with integrity of the spinal cord, destroy, pervert, and alter the sensation and motion of parts supplied by the spinal nerves, we must infer that the cord, like the nerves, depends upon a central focus of action, which must be referred to the cerebrum and cerebellum."

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* Physiologie.

"Two rabbits," says Dr M. Hall (endeavouring to show that the tone of muscular fibre depends upon the cord), "were taken and their heads removed. The spinal marrow of one was cautiously destroyed by a sharp instrument, and its limbs were perfectly lax; whereas in the other, where the spinal marrow had not been touched, they retained a certain degree of firmness and elasticity. The difference was most obvious. *On the following day*, the limbs of both animals *were equally rigid.*[*] The same objection which has been made with reference to reflex action, depending solely upon the cord, also applies to muscular tonicity."

"Exposed muscles," says Professor Muller, "on being irritated, contract without either the centripetal or centrifugal nervous action being requisite; but when the muscles are covered with a skin, they must derive their stimulus to contraction, in the first place, from excitation of their sensitive covering, which induces centripetal action of the sensorial nerves, and centrifugal motor excitation *from the brain.* In this way is produced contraction of the larynx and air-passages from acid gases, or cough from irritation of these parts. It is the same with respect to the sphincters of the anus and bladder. These muscles cannot be excited directly by the presence of the egesta, but these substances act on the sensitive nerves of the membrane, and excite the spinal cord, which being *constantly charged with motor power,* reacts upon them. Hence, after lesion of the cord, their contraction ceases."

M. Flourens also remarks on this point,—"The lower end of a divided nerve may still continue to excite contractions, but only when it is irritated. The nerve has then an action proper to it, but this action must be brought into play by external excitation. The nerve is therefore only a subordinate agent. It is the same with respect to the spinal cord. On its being separated from the brain, all spontaneous movement of the body immediately ceases; it still retains, however, a certain degree of action, and an external irritant may bring this action into play. Like the nerve, it has therefore an action proper to it; but, like the nerve, it has neither spontaneity nor primordiality of action. The spinal cord is consequently likewise only a subordinate agent. This spontaneity of action arises *solely from the brain.*"

These quotations may suffice to show the true relation which the spinal cord holds to the brain, as also the error of a too hasty generalization of the results of experiments upon cold-blooded animals. Thus, when the body of a viper was observed, after decapitation, to continue to direct its course to a hole in the wall to which it was accustomed to retreat; and also when some birds are seen, immediately after decapitation, to continue to run or even to fly to a short distance,—it is by no means to be inferred that these movements are performed independently of the brain, but these instances merely prove the persistence, for a brief period, of an impulse already given. Thus, also, in soldiers tired by a forced march, even while asleep, the legs may continue the movements so frequently repeated, and carry them on unconsciously, and, as it were, mechanically.

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[*] The italics are mine.

"Many movements," observes Cabanis, "take place in the animal economy without consciousness (*a l'insu du moi*), but, nevertheless, through the medium of the sensitive organ. In all those inferior animals which survive the destruction of their brain, the muscular parts, isolated from the sensitive centre, still exhibit, during a longer or shorter period, movements which are maintained entirely by the influence of a sensibility which may be termed posthumous."

In the young of some warm-blooded animals, which, after decapitation, exhibit reactions to external impressions, vitality remains in the trunk so much the longer in proportion as the animal is near the time of its birth. Legallois found that in newly-born rabbits under these circumstances, sensation and motion were retained for a quarter of an hour; whereas in those a month old, these signs of vitality scarcely continued two minutes. The same principle also applies to the instances of anencephalous infants, which have existed for a short time after birth, breathing, and performing some of the instinctive actions, which cannot be continued without a brain; and life consequently soon becomes extinct, being retained longer in those cases where the *medulla oblongata* is present. That neither this part, however, nor even the spinal cord, is essential for the manifestation of these phenomena, is shown by the cases in which this portion of the nervous system is likewise absent. M. Gerdy, in a recent physiological work, states that MM. Fauvel and Mery each exhibited an infant born without either brain or *spinal cord*, but which, nevertheless, lived for several hours. That of Mery lived twenty-one hours, and even took some nourishment. As regards also the sensations and spasmodic contractions of paralyzed limbs on being irritated, which have been adduced as purely reflex actions of the cord, there is no doubt in my mind that the influence of the brain is still excited, though there may not be consciousness of its operation, as is the case when paralyzed limbs are convulsed in epileptic attacks. It would, however, occupy too much time to consider upon the present occasion the various practical bearings of this question. I will therefore conclude by submitting the following deductions:—

1. That in man and the higher mammalia, the brain is the sole centre of the nervous system and the source of power.

2. That the grey matter of the spinal cord and the ganglia of the sympathetic are to be regarded as reservoirs of this power for the immediate actions of the parts supplied, which speedily becomes exhausted if communication with the brain be cut off, and also as modifiers of impressions transmitted from the periphery to the brain.

3. That the automatic and instructive actions are not performed independently of the concurrence of the brain, though its influence is less direct and manifest than in the case of voluntary movements.

4. That the brain is the organ principally implicated in several disorders which have been too exclusively referred to the spinal cord.

Art. IV.—*Practical Remarks on the Endemic Fever of Ceylon.* By J. C. Cameron, M. D., Staff-Surgeon of the 2d Class. (Communicated to the Editor by the Director-General of the Army Medical Department.)

The following details and conclusions are drawn from the experience gathered at the bed-side, during nearly thirteen years' service in this colony, which has led me to abandon the use of bleeding and salivation as the chief remedies in the form of tropical fever prevalent here, and to substitute in their stead the free use of quinine, without any regard to exacerbations, remissions, or local complications.

This practice, although very analogous to that recommended by Clark and Lind in the last century, is, I believe, opposed to the doctrines of the modern schools, as I have generally found my newly-arrived brethren exceedingly surprised by it, and afraid that the worst results would follow the use of quinine during the hot stage of fever. A single trial has, however, generally convinced them of its efficacy in this island. And, in fact, the practice may be considered almost universal in the colony, so that I am induced to submit the results for the information of the profession, in the hopes, considering the general resemblance of tropical disease, that what has been found so great an improvement here, may, upon trial, prove successful in other localities. Fevers are very common in Ceylon, and furnish a large proportion of the admissions in our military hospitals; and, on the whole, I am quite disposed to agree with that experienced and accurate observer, Deputy Inspector-General Marshall, that the fevers (properly so called) of Ceylon are either remittent or intermittent.

The generally-recognized elements for the production of malarious fever exist abundantly here; a great portion of the country is covered with dense forest, interspersed with swampy valleys and rice lands; other more open districts, formerly populous, but now desolate, are converted into extensive marshes by the monsoon rains, and afterwards, under the influence of a vertical sun, exhale the effluvia of decomposing vegetation; and, even in the immediate vicinity of the largest towns, rice fields and stagnant waters abound. It thus happens that fever, in certain districts, has its regular season, and is expected as surely as harvest after seed-time, from the subsidence of the floods until the soil is baked into harmless dryness, when the district becomes comparatively healthy. The natives enjoy no exemption from its ravages; indeed they are often prostrated, while the well-fed and sheltered European escapes, though resident on the same estate; but, in the former, agues are much more frequent than attacks of remittent, and this latter, though, if left to itself, very fatal, rarely presents the same high degree of symptoms, but rather saps slowly the powers of life. The immigrant Coolies from India, who, bent on saving, often half starve themselves, suffer greatly from fever; so do the Malays; but the few Negroes remaining from the old Ceylon regiments enjoy their usual comparative immunity. Old and young residents suffer alike. Perhaps the new-comers, if prudent, have the best chance of resisting the poison. One attack, so far from securing future exemption, decidedly predisposes to another. Locality influences not only the frequency but the severity of fever, as might be expected; but at times the disease will attack individuals resident on the sea-side, and surrounded by every comfort, with as much virulence as if they had been sleeping in a Kandyan jungle. I have no means of judging accurately whether elevation to a moderate height affords much security. I have been told by old residents that our detached posts, which, thirty years ago, were often posted in valleys fully 3000 feet above the sea, suffered from fever. But, from all I can learn, I am inclined to think that its prevalence is greatly lessened by residence on hilly ground above 3500 feet in altitude. At Nuwera Ellia, where the barracks are at a height of 6500 feet, fevers are very rare (though I have seen one case of severe remittent there, which very nearly proved fatal); yet the "plain" consists chiefly of a deep swampy bog, and the men are quartered on the banks of a small stream, which in rainy weather overflows the ground adjacent. Such situations in the vicinity of streams in the low country are generally favourite haunts of fever.

Certain years prove much more sickly than others, without any very evident cause, and occasionally fever has prevailed epidemically with great severity; and, during field service in the Kandyan country, its ravages were often awful, exceeding even the mortality of plague.

That this is no exaggerated term, the pages of Colonel Tulloch's statistical reports abundantly prove. For we there find recorded that, in 1818, out of one detachment, consisting of 254 officers and men, 209 died of fever in a few weeks, while only 4 of the party escaped an attack. And, even during profound peace, as in 1824, the deaths under this head throughout the island amounted to ten per cent. of the white troops; and at the two stations of Kornegalle and Kandy, to 113 out of a garrison of 420 Europeans.

Reference to the older hospital records shows that the symptoms observed in the remittent of thirty years ago do not in any way differ from those of our own day; and, generally speaking, there is a remarkable sameness of cases always observable in this disease, subject of course to modifications from temperament, pre-existing local affections, or constitutional peculiarities.

In general, muscular pains, a feeling of debility, loss of appetite, and restless nights, precede the development of fever for a longer or shorter period, sometimes for several days. The joints feel stiff, the loins and thighs as if they had been well beaten, being even sore on pressure; headach and chilliness follow; sometimes severe and continued rigors take place, more frequently an intolerable sense of coldness without tremor, succeeded by alternating flushes of heat, which gradually becomes ardent. Headach next becomes intense, often lancinating and aggravated by the slightest motion, the patient holding his temples with both hands, and moaning from pain. The respiration is quickened and laboured, from a sense of weight at the *præcordia*. This is often attended with nausea, and in severe cases with bilious vomiting. Thirst is uniformly great; the tongue white, furred, and moist; the urine scanty and high coloured; the bowels often regular, but the evacuations offensive. There is frequently great soreness to the touch, and painful stiffness in moving the eye-balls, but seldom any intolerance of light. The head feels excessively hot; so generally does the stomach; but it is rare to have any localized pain except headach, unless the patient has suffered from hepatic or splenic disease; and then very often both organs, but especially the former, are complained of.

The duration of the hot stage varies according to the severity of the attack, but usually lasts for some hours, not exceeding twelve or fourteen. And then a remission takes place, commencing with perspiration, which often becomes profuse, especially if bleeding has been had recourse to. The headach abates very much; a general feeling of relief is experienced; the patient becomes cheerful, and persuaded that the worst is over. But by and by the skin begins gradually to dry, thirst returns, a degree of cold rarely exceeding chilliness is again experienced, and the hot fit recommences, very often with increased violence.

If the disease proceeds unchecked, nausea becomes a prominent symptom, and the vital forces are remarkably depressed after each paroxysm, of which there is always one, and sometimes two, or even more in the twenty-four hours; but it soon becomes impossible to distinguish any remission. The skin is either dry, and of a peculiar burning heat, unpleasant to the touch, or damp and clammy, particularly on the hands and arms; the countenance sunken, with a purple flush on the cheeks, or deeply tinged with bile; the tongue dry; teeth covered with sordes; in fact, all the appearances of European typhus are seen. Sometimes, but rarely, the patient is sensible to the last, although apt to wander, when lying quiet, talking in an unconnected strain of distant scenes or his ordinary duties, and sensible that he has been doing so, when his attention is awakened by being addressed. In other cases he will leave his bed and attempt to walk out to parade, or to see a friend, generally without noise or excitement, seldom resisting a request to lie down. But in the great majority of fatal cases, low muttering delirium takes place, with much stupor, from which the patient can be roused by shaking and loudly addressing him, and at first will probably answer rationally a question or two, uniformly declaring he has no pain; but coma speedily supervenes, with subsultus and hiccup, and in this state the patient most commonly sinks to rest. Occasionally death takes place in the hot fit; but in the few instances of the kind I have known, the patients were stout and full blooded, and cut off at an early period of the disease. Except in such instances, the course of this fever is more protracted than usual in other tropical climates, death rarely taking place before the 10th day, and sometimes not till the 20th, or even longer. It deserves remark, that deafness, which used to be regarded as a favourable symptom in typhus fever at home, is here very much the reverse; and when conjoined with an early appearance of a jaundiced tint, or deep bilious suffusion, generally fatal. But, as most truly observed by Mr Marshall, and deserving of constant remembrance by all concerned, "the fatal tendency of the disease is often not in proportion to the apparent violence of the symptoms. Sometimes cases terminated fatally without the appearance of a very violent disease. The danger was often great, although the symptoms appeared mild." This important truth should be ever present to the mind of a medical officer in Ceylon, for it is impossible to judge accurately at the beginning of fever how it will proceed, especially on the negative side of the question; we may often predict a severe and dangerous attack, but never can be sure of the contrary, however mild the commencement appears. On this head I received many sharp lessons in the early part of my service here, for it is especially in its commencement that fever is amenable to treatment. The lapse of a few days, without the use of proper remedies, gives it a fearful start.

On dissection, the general appearances afford little indication of any local affection; the surface of the body is sometimes uniformly yellow, and this tinge may extend to the fluids, so that the serum from a blistered surface will stain a cloth like turmeric.

The veins of the brain are generally congested; perhaps a small degree of effusion may be found in the ventricles, and likewise under the arachnoid, but without any traces of membranous inflammation. The lungs are found simply congested; the blood appearing dark and pitchy; the liver friable, and gorged with blood; the gall-bladder turgid with dark bile, the spleen also congested and soft.

The intestines generally present a dusky-leaden hue. The stomach often contains a dark grumous fluid (the black vomit of the West), its lining membrane being soft, and easily torn, with occasionally considerable vascularity of the great curvature. In cases in which vomiting has been a prominent symptom, the *duodenum* is generally found vascular, and tinged with bile. The other intestines seldom display anything extraordinary. The kidneys appear congested, the bladder small and contracted.

On the whole, the brain is generally the organ that seems most involved, though in none are appearances less correspondent to symptoms, or consistent with them; but it is evident that the malady is a disease, not of any one organ in particular, but of the whole system; in fact, that the patient has died from the effects of a subtle penetrating poison.

The treatment pursued in this malady, from the date of our conquest of the island till within the last eight years, as far as I have been able to ascertain, was pretty much that so forcibly inculcated by the late Dr Johnson in his widely influential work on Tropical Diseases. Mr Marshall, speaking from his experience here, between the years 1808 and 1821, states, that "when bleeding, purgatives, and cold ablution failed to arrest the progress of the disease, all that could in general be done, was to endeavour to alleviate symptoms;" he neither alludes to mercury nor bark. But I have the best reasons for believing that the former potent agent for good or evil was most freely used in fever, and indeed regarded as the sheet-anchor in its treatment during the fearful ravages of the disease before adverted to. Certain it is, that I found it so esteemed on my arrival in 1836, and being then quite a Johnsonian practitioner, relied on the lancet and calomel as the sovereign remedies in tropical fever, never feeling secure of my patients till salivation proclaimed their safety. When that could not be brought on, the cases were generally deemed, and proved hopeless.

Certainly, when this practice is successful, nothing can be more brilliant. The disease is attacked *au pas de charge*, and its strongholds carried. But reading such cases is very like reading the gazette of battles. Dwelling only on the victory, we are apt to overlook the cost, to forget the bloodless faces, the shattered frames, and broken constitutions. Experience, however, will soon teach the young medical officer, especially in the tropics, how necessary it is to think, not only of curing his patient, but of curing him with the least possible expenditure of strength and constitution, and this I fear is oftened overlooked. In warm climates great losses of blood are very slowly repaired, and convalescence tedious; and if a soldier is drained in this way again and again, his frame soon becomes too weakened for service in the East. Salivation also is too frequently regarded as a trifling matter; but setting aside the sufferings of many patients under it, and the length of time they are necessarily rendered ineffective thereby, the free use of mercury is highly injurious to many constitutions, and cannot be resorted to again and again with impunity, even in the strongest. It ceases to salivate such subjects, and brings on instead a febrile state, during which the vital actions are seriously depressed, and the progress of destructive disease, such as dysenteric ulcerations, &c., rendered fearfully rapid. It may be doubted too, whether salivation is not often more a consequence than a cause of the disease yielding, for which mercury has been administered. Every one must have seen it supervene after amendment has set in, and even in cases where, from apparent inefficacy, the mineral had been discontinued. That it is often of the greatest utility no one will dispute; but I recommend every young officer to do without it when he can. I am writing solely from experience, and therefore do not presume to pronounce an opinion on its use in other countries beyond what may be drawn from analogy. All I can say is, that I manage now to cure my patients without the use of mercury, in either fever, liver disease, or dysentery, in all the branches of which tropical triad, I used to employ it most feeely, and with very tolerable results too; for there are various modes of curing the same disease, —a fact that medical bigots are prone to overlook.

From the description given above of the onset of fever, bleeding from the arm will naturally suggest itself as a means of relief; and if practised when the patient is burning hot, and complaining of severe headach, its good effects will appear remarkable; the pulse will fall, the pains disappear, and the heat of skin be relieved by general relaxation of the capillaries, and copious perspiration,—the patient declaring that he feels quite another man; but all this apparent amendment may be said to be mechanical; the return of the paroxysm puts an end to it, to the great annoyance of the medical attendant. A fresh abstraction of blood again gives relief, at the expense, however, of great debility, and it can rarely ever be attempted a third time. Bleeding from the arm, then, must be looked on as an expensive auxiliary, occasionally necessary, perhaps, in full-blooded subjects, but only to prevent mischief during the hot fit, or when a decided local affection exists, as in a man subject to acute hepatitis. It cannot be expected to cure a fever, which does not depend upon any inflammation, but on the presence of a sedative poison in the system.

Leeches are far more useful, and should be applied freely to the temples in cases where headach persists, or is remarkably severe; but when I say freely, I mean with due precaution, *first*, as to our patient's frame and sex; *secondly*, as to the period of fever,—a very small loss of blood in its latter stages being apt to produce fatal sinking; and, *thirdly*, as to the stage of fever when they may be applied,—the danger being extreme of abstracting, at the close of a paroxysm, the same quantity of blood which might have proved beneficial during its height. As this is a point of the utmost consequence, and one that is often wholly overlooked, I beg to refer to Mr Twining's remarks on the subject, in his work on diseases of Bengal (page 652 of the edition of 1832), where he gives several cases of death ensuing from mistakes of the kind now specified; and to which I can add an instance where a stout, plethoric, fat, European gentleman, bled largely from the arm, during the stage of free perspiration, on the second day of remittent fever, died, unaccountably, as it was considered, within a few hours after.

With the above precautions, the use of leeches will be found the best mode of abstracting blood, in all the local complications of fever, taking care to have their effect watched by a competent person, with directions to remove them if collapse seems approaching, and forbidding any flow of blood to be encouraged from their bites. In practice, I have found a discretionary authority on this head so mischievous, that I always direct a proper number of the animals to be applied, and the bleeding stopped as soon as they fall off. In the more advanced periods of fever, a very small number only—four or six—should be used; for they are exceedingly large and active. I have more than once seen the use of this number over the epigastrium, or to the temples, as the symptoms indicated, decide the favourable issue of the case, when the fever had continued long in a low form.

To sum up, then,—I would recommend the avoidance of general blood-letting if possible. When practised to moderate the vascular excitement of the hot fit, it should not be carried farther than to accomplish that end, which the loss of sixteen ounces will generally effect.

If fever attacks a stout man, who perhaps lives freely, and has sustained one or two smart attacks of hepatitis, it will generally be attended with marked determination to the liver, sharp pain on deep inspiration, &c. Here we must not run risks with such a treacherous organ engaged; but, unless there be some strong reason against it, bleed boldly till we free the breathing, and conjoin the necessary treatment for liver disease with that essential for the remittent.

Headach will not require more than free leeching, and, where the patient is strong, it is wise to be on the safe side, and use it early, although it is at first surprising to note what severe headach will subside without any depletion. We must always be on our guard as regards cerebral congestion, and carefully distinguish between the delirium of vascular action and that of nervous excitement. In the latter, the use of a solution of tartar-emetic and opium, as recommended in typhus by my old teacher Dr Graves, will be found most efficacious. Sleeplessness is a marked feature in this fever; even in its slightest cases, we will find patients unable to close an eye for two or three days and nights successively; this yields to the use of quinine; but if unusually prolonged, and unattended with headach, or other suspicious symptoms, morphia administered in a full dose, say half a grain of the muriate of morphia, will give relief.

One of the most embarrassing symptoms is gastric irritability, for which reason I never use emetics in the treatment. This symptom must be combated by leeches and blisters applied to the epigastrium, ice internally when procurable, and small doses of morphia in soda-water or effervescing draughts.

Purgatives are useful in the commencement of the disease, but must not be over-valued or given too largely. Hypercatharsis is apt to come on and prove troublesome. The bowels must be well cleared out at an early date, after which ordinary attention will suffice.

I have never practised, or seen tried, the cold affusion; but sponging with very hot water often produces relief to the heat of skin; and the tepid-bath at 92° seems still more efficacious, particularly with children. I have seen immersion in it for fifteen minutes lower the pulse forty beats, and procure refreshing rest when other means completely failed.

I come now to speak of the employment of quinine, which I regard as the most important agent in the treatment, and one to which all the measures above-discussed must be considered in a great degree subordinate. I believe I am correct in stating that its employment, during the height of fever, is opposed to all the rules laid down in standard works of the present day on such matters; for, on reference to the article "Remittent Fever," in Dr Copland's unrivalled Dictionary, I find the learned author expressing himself as follows, speaking of the exhaustion of the advanced stages:—"In such cases, suitable means are devised with great difficulty. If the exhaustion be attended by a distinct remission, the pulse falling in frequency, and the tongue remaining moist, the irritability of the stomach having subsided, the exhibition of bark or quinine should not be delayed, for by it chiefly are we to hope to prevent an accession of the febrile action, and to preserve the powers of life from the noxious influence of the surrounding causes. But the effect of this substance should be carefully watched; as long, however, as the tongue is dry or rough, with the papillæ erect, the pulse hard or irritable, and the skin hot and harsh, the remains or unfavourable consequences of the previous morbid action are still unsubdued, and these the exhibition of bark would increase." These were exactly my own ideas on commencing acquaintance with tropical fevers; I had, in common with my brethren, a dread of running the least risk of giving quinine as long as any local or high febrile affection was present; feeling assured that if such a mistake were committed, the result would certainly be to aggravate it; and not a few cases have I known lost in this way, amid deep regrets that there was never an opportunity of giving quinine, there being no remission. Another firmly-rooted idea, and one which I believe to be very general, was, that a certain amount of antiphlogistic treatment must needs have been undergone, before the system could bear the use of quinine, so that the idea of giving it was seldom at all entertained till the third or fourth day of fever; and then it was timidly ventured upon in grain doses, and stopped the moment the least exacerbation set in.

My first glimpse of what could be done with this remedy was obtained as follows, in the case of a European of irregular habits recently from England, attacked with high fever, in an elevated cool station. This person was freely bled, dosed with purgatives, and saline antimonial mixtures, followed, as the disease persisted, by the use of calomel and James' powder; but all to no purpose: the mercury would not affect his gums, he had no apparent local disease, but his skin remained burning hot, at all hours alike, with great thirst, and a dry tongue, which finally become quite black, his pulse being generally 130. After some days in this state he seemed fast dying, and about the middle of the night, which I thought would be his last, having gone to the hospital for a final visit, I was surprised to find his pulse had fallen fully 40 beats, and immediately thought of quinine, but hesitated when I considered his hot skin and rough dry tongue; however, the case being desperate, I shook about ten grains of the sulphate on the tongue, and washed it down, leaving a similar dose to follow soon after, with some curiosity, but very little hope as to the result. Morning nevertheless found him decidedly better; the fever soon remitted with perspiration; quinine was continned in such intervals, and the man escaped from the jaws of death, after a long convalescence.

I pondered over this case a good deal, but chiefly on the strangeness of a remission appearing so late in the disease, and at such an unusual hour, and my good fortune in stumbling upon it. I mused upon the state of skin and tongue too, so unfit apparently for the action of quinine, but put it down as an anomalous case, irregular every way; and went on bleeding and using antimony to begin with, and getting my patients under the influence of mercury as fast as possible, whenever their fever persisted, till the year 1840, when remittent was very prevalent and fatal about Kandy, where I happened to be on leave, and was requested to see the following case:—

A. D., a European girl aged 20, stout and healthy, had been resident with her family upon a coffee estate in the neighbourhood, and there contracted fever, which had carried off all her relatives. Her brother-in-law, hearing of their deaths, came up from Colombo, and finding her given over in the same disease, by the officer who had kindly attended the whole family, came begging me to go and see the case. I found her rolled up in a heap near the bottom of the bed, picking at the bedclothes, in a state of low delirium, with all the appearances of bad typhus. The skin was parched and burning; the cheeks tinged with a livid flush; the lips and tongue black and dry; while the senses were offended with an intolerable fetor of person and breath, partly proceeding from deep sloughing ulcers of the cheeks and gums, caused by the use of calomel, which, however, had not induced salivation. The pulse was very small and sharp, 144. The patient had been ill about a fortnight. I entirely coincided with her attendant as to the hopelessness of the case, and told her friends so; but as they implored me to try something to save her, I proceeded to the quarters of my friend, a young officer lately arrived in the colony, and inquired the particulars of the case. He told me its history, the usual symptoms of remittent; how he had bled, and purged, and tried to salivate her, but in vain, and finally gave her up in despair, as her relatives had just run the same course, ending in death. On suggesting the use of quinine he was quite surprised, considering it wholly inapplicable; but, on my relating the case given above, readily consented to try it, and ordered five grains to be given every third hour, beginning directly, as all traces of remission had long ceased. The amendment this produced seemed almost miraculous,—so marked and speedy was its appearance. The low delirium went off, and some quiet sleep was obtained; a purgative now brought away some very fetid discharges; and with occasional repetitions of it, and the continued use of quinine, the case went on to a favourable termination, though with much delay and suffering from the mercurial ulceration in the mouth, which nearly perforated the cheeks, and after healing caused such contraction, that the poor girl was obliged to live on fluids, till I succeeded in dilating her jaws by the use of a series of cork-wood wedges.

The circumstances of this case quite shook my faith in the received doctrines about the dangers of using quinine, and I began cautiously to try its effects in the earlier stages of fever. The subject was warmly taken up by my esteemed friend Dr Templeton of the Royal Artillery, who suggested the addition of James' powder to the quinine, as favouring its action, and having febrifuge qualities of its own, which, in his opinion, lessened the chance of quinine producing any mischief, for it was a long time before we shook off all fears on this head. This combination seems advantageous where the stomach is not irritable, but in such cases I have often discontinued the antimonial, and used the quinine alone with perfect success.

My general plan of treating fever now is as follows:—I begin with a good purgative (for a stout man, some fifteen or twenty grains of a mass of colocynth, scammony, and gamboge), and order, at the same time, twenty grains of quinine, with an equal quantity of James's powder, to be divided into eight doses, and one given every third hour regularly. This, in general, soon relieves the violent headach, pains in the loins, &c., and is steadily continued without any regard to exacerbations. As symptoms arise, they are met in the way formerly indicated; but on no account is the quinine stopped if the stomach can be made to bear it, the James's powder being omitted if necessary, and the chief remedy given in pills or solution, as may be easiest for the patient to take.

Treated in this way, the vast majority of fever cases, if early attended to, will give very little trouble, and are cured at such a small expense of strength, that the patients are but a short time rendered non-effective,—a point of great consequence in military medicine. If, on the other hand, the disease is neglected, and allowed to gain ground unopposed for some days, it often becomes very difficult to manage; hence the danger of the slow insidious form in which it occasionally makes its approaches. A patient may complain principally of loss of appetite and debility,—the latter, in his opinion, solely consequent upon the former. His tongue is furred; bowels confined; he has slight headach, which he terms bilious; rests very badly, and complains of tossing about all night; his skin and pulse are perhaps natural, or even below par in the morning, at the usual hour of doctor's visits in the East. Probably he has been living irregularly, and ascribes his indisposition to that cause. Purgatives are prescribed, which bring away offensive stools, and afford great relief; so from day to day expectations are entertained that to-morrow, or in a day or two, he will feel much better and be all right, till at last he is found some morning in a state of stupor, sinking into coma. It then comes out, on cross-questioning a stupid native servant, that for nights past his master has been talking a great deal to himself, and sometimes speaking nonsense. A blister is applied forthwith, calomel administered, &c., but all to no avail; the patient is never roused from his deadly stupor; and on dissection, all that is seen is more or less serous effusion within the head, with congested veins. I remember a case of this nature in a young captain who died five years ago. He had taken nothing but colocynth and soda during ten days' indisposition, and the day before he died laughed incredulously at the idea of danger, saying he was only a little weak, and would be out again in a few days.

Before proceeding to give some cases illustrative of the above statements, it occurs to me that my sketch of treatment is incomplete, without a few words on diet,—a part of the management of fever,—which I fear is often greatly neglected, particularly among the many sojourners in the East, who are necessarily left to be nursed by strangers and servants. It is essentially requisite that the medical attendant should enforce the use of sufficient nourishment. Patients have frequently a dislike to the very idea of food, and if not looked after will starve themselves for days—nay, I think I may add, to death,—for I have certainly witnessed cases where a fatal result was clearly due to neglect of giving food.

A little arrow-root or gruel may always be taken twice a day, and after the fifth day, chicken soup in small quantities, thickened with bread. The greatest difficulty will often be found in getting this complied with; and the doctor must often see it done, and even feed the patient himself, where no other person possesses sufficient control over him.

As my chief aim, in drawing up this paper, has been to contrast the results of two different modes of treating the same disease, and to induce a trial of that which I advocate, wherever fever may be found of the same character as here described, I shall commence my selection of cases by giving two which proved fatal,—one in the year 1818, and the other in the year 1840,—in order that the reader may compare their details with those that follow, and judge for himself of the identity of the malady, and the effects of remedies upon its progress. The first is quoted from Mr Marshall's work on Ceylon, and given by him as an average example of the fever which caused such fearful mortality, and of the mode in which it would best be combated.

Case I.—Robert Bruin, 45th Regiment, aged 28, of a spare habit; has been seventeen months on the island, and has generally enjoyed good health. Admitted into hospital on the forenoon of the 11th November; said that he had been attacked that morning after he had been relieved off guard, with headach, pains, and weakness of the extremities. Pulse was quick; tongue foul; skin natural. Was bled on admission to the extent of three pounds, and a purgative administered; towards evening he was attacked with urgent febrile symptoms and renewed headach; a blister was applied to the nape of the neck On the following morning the symptoms had remitted, and he was quite free from headach; the purgative was rejected; he was allowed an acidulous drink; febrile symptoms recurred that evening with less severity, but accompanied with great irritability of the stomach; he continued from that date (13th) to have an evening accession of fever, and was almost constantly affected with nausea and vomiting. Purgative remedies were daily administered, which produced free purging. During the increased heat of the body, cold ablution was used, and acidulous drink prescribed. On the 19th the fever recurred with increased violence, and the vomiting continued almost incessantly; at that period he became much exhausted; pulse quick and small; tongue dry and brown. Saline diaphoretic draughts, with a few drops of *Tr. Opii* in each, were now ordered. He was allowed two gills of wine.

On the evening of the 21st the usual accession of fever took place; he expired next morning at three o'clock.

APPEARANCES ON DISSECTION.—*Cranium.*—*Dura mater* preternaturally red; *pia mater* natural; substance of the brain apparently healthy; half a drachm of fluid was found in each lateral ventricle; half a drachm in the base of the cranium.

In the thorax all the viscera were natural.

In the abdomen the viscera were healthy; liver weighed four pounds thirteen ounces; spleen one pound three ounces.

Case 2.—John Jackson, aged 20, 90th Light Infantry, 18th March 1840. (Reported by Staff-Assistant Surgeon Dr Kelly). This lad was taken into hospital on arrival from England, as not quite recovered from a slight catarrh. On the 20th at evening visit he complained of pain across the loins and in his limbs, slight headach and giddiness. Skin hot; tongue furred; thirst; pulse small and quick.

Ordered a dose of castor oil.

March 21*st.*—Passed a good night; feels better in every respect; had two very large feculent motions from the oil; pain of the back removed; no headach; pulse slower; tongue moist.

Ordered a saline diaphoretic mixture.

22*d.*—Feels somewhat better this morning, but complains of debility. No headach; tongue slightly furred, and moist; bowels acted several times very freely; stools feculent and very offensive; thirst diminished; skin not so hot.

A pill, consisting of half a grain of the blue pill mass, one grain of compound powder of ipecacuan, and three grains of extract of gentian, was directed to be taken three times daily.

Vespere.—Increase of fever this afternoon, with some slight cerebral excitement; had an attack of vomiting since last visit.

Twelve leeches to be applied to the temples, and the head to be shaved.

23*d.*—Passed a restless night; feels his head relieved by the leeches; skin moist and perspiring; tongue furred; pulse small and weak; bowels open twice during the night; stools dark-brown and feculent. Does not complain of pain anywhere; says his head is quite free from it, but that he feels great debility.

Chicken broth. To continue the pills,—cold lotion to the head.

Vespere.—Reports himself better; the bowels have been acting frequently during the day.

24*th.*—Passed a restless night, and was delirious; skin moist; pulse quick, small, and weak; tongue slightly furred; bowels open; coughed frequently during the night; thirst; no headach.

A mixture was ordered, consisting of two drachms of antimonial wine, and half a drachm of spirit of nitrous ether, in two ounces of camphor mixture, two ounces of mucilage, and two ounces of water; and this the patient was directed to take in the course of the day.

Vespere.—Restless, and very talkative all the afternoon.

A blister to be applied to the nape of the neck.

25*th.*—Passed a very restless night, and was delirious; tore off the blister, which, however, has acted well. Pulse extremely small and weak; skin rather cooler and moist; tongue moist; white in the centre; red at the edges; less thirst; bowels opened twice during the night; stools feculent; is anxious, talkative, and restless in manner.

Continue the mixture as yesterday.

26*th.*—No improvement; was extremely restless and delirious during the night; talks incoherently now. Skin dry and hot; pulse small and very quick; no intolerance of light; tongue moist and furred; thirst; bowels open; skin assuming a yellowish tinge.

Ordered a blister to the occiput; calomel and James's powder at intervals.

From this date it is needless to pursue the case; although the patient survived till the fourth of April, no change took place in the symptoms, delirium and debility being the prominent features.

On dissection, the usual venous congestion was observed in the brain and membranes, but no inflammation or effusion; the organs in the thorax were healthy; the stomach congested, and the mucous membrane generally dark-greenish coloured. The only disease was in the cœcum, where were some small patches of ulceration.

This was a distinct case of remittent, though returned as Febris C. C. From this disease the regiment lost in 1843 fifteen men, most of them within a few weeks, during the period the disorder prevailed in the interior.

Case 3.—William Church, aged 34, admitted 4th May, a healthy man, seven years in the island, was attacked while on guard yesterday with rigors, muscular pains, and headach, but managed to do his duty; and feeling better, did not report himself this morning. His symptoms, however, returned severely about 10 A. M., and he fell in the ranks, attempting to go to church. Complains of severe headach, with great giddiness, and general debility; severe aching in the loins and thighs; pulse moderate, rather full; skin warm; tongue moist and furred; bowels open.

Ordered a brisk purgative.

May 5.—Bowels very freely purged; he shivered all night, and is now exceedingly hot. Pulse 102, and full; intense headach, darting through from side to side.

To take three grains of quinine, with three of James's powder, every third hour.

Vespere. Headach diminished, and feels rather easier.

6th.—Passed a restless night, without any sleep. No headach, but much confusion of thought; skin tolerably cool; pulse small, 104; feels considerably better on the whole.

Ordered to continue his powders as before.

Vespere. The fever returned, with severe headach and continued vomiting; he is now very hot; pulse 96, full; bowels three times moved

Apply twelve leeches to the temples; continue the powders as before.

7th.—Much relieved by the leeches; headach gone; some giddiness remains. The lumbar pain has disappeared; he had some sleep; is now quite cool, and his pulse down to 84.

To have a purgative draught; continue his powders every fourth hour.

8th.—Doing well, no return of fever; bowels freely moved.

Continue his powders every sixth hour.

9th.—Had a little fever yesterday; did not sleep well; is now quite cool.

Repeat the purgative, and continue the powders as before.

From this date there was no return of fever; bark was substituted to save quinine; and on the 17th he was discharged to duty.

This is a specimen of the ordinary attack of remittent, very similar to that detailed in Case 1, and of which my hospital records would furnish scores. I shall now give an instance of more severity.

Case 4.—Lieutenant W., aged 24, dark-haired; sanguineous temperament; stout and muscular; a free but not intemperate liver; of very active habits; has been shooting in the swamps frequently for the last three weeks, during the noon-day heat; was attacked on the 14th February 1846 with languor, muscular pains, and general chilliness; spent a miserably restless night, during which he grew hot, and vomited a good deal. Seen at 1 P.M. on the 15th. Complains of intense headach, and great pain and stiffness along the cervical spine, muscular soreness and aching all over the body, especially the loins and legs,—which latter are so cramped and tender to the touch, that he can hardly use them. Face flushed; skin very hot; breathing oppressed; pulse full and bounding, above 100; great thirst; furred, moist tongue; bowels not open last two days.

Ordered full doses of purging mixture till the effect is produced.

15*th February*, 7 P.M.—The bowels have acted freely, with slight relief to the headach; all other symptoms are unchanged.

One scruple of disulphate of quinine was mixed with the same quantity of James's powder, and the whole was divided into eight parts, one of which the patient was ordered to take every third hour.

16*th*.—Spent a bad, restless night. His headach is very great, and attended with much confusion, so that he cannot attempt to think on any subject without a sensation bordering on delirium. The pain shoots through both temples, and is aggravated by turning on his pillow, however gently. Is in a high state of fever; pulse 126; skin hot and dry; complains greatly of the distressing stiffness and aching in his neck, as well as over his body,—his legs being so much affected that he cannot stand. The bowels acted freely in the night; has taken three powders; feels squeamish, and complains of weight at the epigastrium and oppressed breathing.

Apply ten leeches to each temple; cold wash to the head; and continue the powders as above.

Being unable to bear his head raised at all, the leeches were applied first to one temple only, and though the bites were stanched as soon as possible, he became very faint, and sent for me. His pulse being very rapid, and the feeling of debility great, it was thought advisable to defer the application of the second ten leeches. The pain in one temple was quite relieved, but continued severe in the other.

4 P.M.—Ten more leeches now applied, and with great relief; the pain no longer felt except on moving the head. Muscular pains continue; has taken his powders regularly; pulse down to 100.

17*th*.—Had a good deal of sleep, and feels better; headach gone; heaviness remains, and much pain in the neck; muscular pains less; bowels free; sweated copiously last night; pulse 90, and soft; complains of thirst; tongue foul.

Continue the powders.

Vespere.—Had a sharp exacerbation of fever about noon, with return of headach; it is now subsiding.

Continue the powders, and let him take a purgative draught at daylight to-morrow.

18*th.*—Vomited a good deal of bile last night; the exertion brought on some headach. Slept pretty well afterwards at intervals, but took his powders regularly. Has been freely purged by the draught; fainted repeatedly; pulse soft, 90; tongue very foul; a good deal of thirst remains.

Vespere.—The febrile exacerbation to-day was much less marked, and later in appearing. His skin is now moist, and pulse 96.

19*th.*—Was again sick at same hour last night; ascribes it to drinking too much lemonade, &c. Had rather a restless night, and is slightly feverish this morning. Pulse 92; tongue very foul; considerable thirst; the pains in the body and joints are nearly quite gone.

Continue the powders as above.

About noon was much annoyed by vomiting; could not retain anything on his stomach. A mustard cataplasm was applied, and gave great relief. After its removal, he took, at slow intervals, a cup of arrow-root, and retained it.

Ordered to take three grains of quinine every fourth hour, omitting the James's powder.

20*th.*—Doing well; tongue cleaning; retains his food; had a little headach to-day, with slight heat of skin.

Continue the quinine every sixth hour.

21*st.*—Slept very well; tongue much cleaner; thirst gone; pulse 76; convalescent.

Continue the quinine twice a day.

From this date he progressively improved; and not having to contend against the debilitating effects of loss of blood and salivation, was very soon able to resume his duty. It will, I think, be readily admitted that this was a sharp fever, and that its whole history speaks strongly in favour of the quinine treatment,—even admitting that the patient would have recovered under the Johnsonian plan of treating such symptoms as he displayed. I had one very good opportunity of contrasting the results of the two plans in the same individual,—a young, dark-complexioned, melancholic, staff-officer, of bilious habit and slender frame. He was attacked with fever, from sleeping naked in the land-wind, after drinking more than usual at a mess-dinner, soon after his arrival in the colony. His case gave me much anxiety; and after being bled and salivated, he had to go to the hills for three months, and recovered his strength but very slowly. He had no similar attack for nearly two years, and had shaken off his fears of the climate, when, after shooting in the swamps, under a burning sun, he was attacked with the premonitory symptoms of fever, lassitude, depression of spirits, &c., and disregarded them for some days. A severe paroxysm then set in, with great headach and irritability of stomach. For this I prescribed on my new system, to the great astonishment of a young brother officer, who had seen the case in my absence, and who, having served in Africa, remarked to me, "that if at Sierra-Leone, I should be regarded as about to murder my patient;" intimating that fever there set in much in the same way. The result made a convert of him, as my patient was convalescent in four days, to the astonishment of himself and his family.

I shall say no more regarding the advantages of this mode of treating Ceylon fever. Its superiority has caused its universal adoption throughout the colony by all who have ever tried it. A more interesting inquiry is, whether it would prove equally successful and applicable elsewhere?

From the circumstance of my present station being the rendezvous of Eastern steamers, I have had a few opportunities of treating *imported* fevers; and as far as they go, these cases certainly encourage my hopes. I shall here only give one of them, which was very deserving of remark, not only from its serving to contrast the two systems in question, but from its showing that quinine can be freely given with the greatest safety and advantage, notwithstanding the existence of decided visceral disease.

Case 5. — Lieutenant D., Royal Navy, aged 27. 16th February 1847. Summoned to go on board a steamer just arrived, and visit an officer reported to be dying. Went at 8 A. M., and found an emaciated sallow subject in a state of general fever, with his head shaved, having been delirious all night; a blister on the nape of his neck, and another on the epigastrium. His symptoms as follows:—skin hot and dry, especially the scalp; pulse small, sharp, and weak, 108; tongue furred; thirst intense; much irritability of stomach and some hiccup; complains principally of sharp pain through the liver, much increased by pressure or deep inspiration. General history:—was invalided for dysentery and liver from this station some years ago; returned to it last year, and, in the month of May, at Madras, had a severe attack of hepatitis, and has never since been wholly free from it; has had repeated attacks of fever; got remittent severely on the coast of Borneo last August, for which he was salivated, and has never been well since. Was invalided at Penang a few days ago, and strongly dissuaded from attempting the overland route, but embarked five days ago, after fatiguing himself considerably. Three days since, fever set in with sharp pain in the side, for which a few leeches were applied, but gave no relief, and weakened him fearfully. He appears to have had a marked remission of fever yesterday afternoon, but was very bad last night, requiring to be kept in bed by force; can only speak now in a whisper, and expresses his conviction that he is dying. The treatment, in addition to the few leeches above-mentioned, has been the application of blisters to the head, side, and stomach, and the use of ten-grain doses of calomel at short intervals, which the surgeon states have been given at the patient's urgent request, he having been told that his only chance of reaching England was to keep his mouth sore all the way. No symptom of salivation at present; bowels rather loose; stools dark and fetid.

Ordered to take three grains of quinine in pill every third hour, beginning immediately.

He was now removed on shore.

Vespere.—Fever has remitted; pulse 88; has taken nine grains of quinine; some hiccup, but no vomiting; great thirst, which he is prohibited from gratifying. Two fetid black motions.

Ordered to continue the pills every third hour.

17*th.*—Had some broken sleep, and was not at all delirious; perspired very freely; skin soft and moderately cool; pulse 84. Complains much of thirst and pain in the right side; cannot bear pressure over the liver; the conjunctiva is quite yellow.

A purgative draught, consisting of one scruple of powder of rhubarb and one drachm of sulphate of potass, with ten grains of compound cinnamon-powder suspended in ten drachms of cinnamon-water, was ordered to be taken immediately.

To continue the quinine as before.

Vespere.—The draught produced three free motions, the first of which was very dark and offensive. He has not had much exacerbation of fever to-day beyond general increased heat about noon. The irritability of stomach has quite subsided, and he has taken a little arrow-root and jelly.

Continue the quinine to-night.

18*th.*—Rested badly, and complains much of his liver, as he cannot lie on his left side from the pain and weight in the right hypochondrium. Thirst great; tongue moist, but much furred.

The purgative draught, with one drachm and a-half of sulphate of potass, to be repeated.

Let him take two grains of quinine in solution every third hour, as he dislikes the pills.

Vespere.—Has had more fever to-day; the skin is now hot, and pulse 92; is very desponding, having parted with his homeward-bound friends; feels extremely weak, obliged to be lifted in bed, speaks in a whisper, and says he is sinking fast. Has taken some soup and custard-pudding.

10 P. M.—The fever has remitted; pulse 88, and some moisture on his skin; feels disposed to sleep; has taken his quinine regularly all day.

19*th.*—Had a good night, and is cheerful. Pulse 76, soft, but weak; skin cool; tongue moist; thirst less; the bowels have acted three times, and the discharges are much improved; the side is certainly easier.

Repeat the purgative, and continue the quinine every fourth hour.

From this date the fever gave no farther trouble, the quinine being gradually lessened, and omitted altogether on the 25th, when the liver claimed attention. As his strength improved, leeches were repeatedly used, followed by blisters, and a constant steady purgation maintained, under which system he gradually gained ground till the 15th March, when, having got chilled, fever came on severely with intense headach, and pains all over the body, the symptoms, according to his statement, being identical with those of the Borneo remittent. Quinine and James's powder were immediately had recourse to, and, by these alone, conjoined with purgatives, the fever was completely conquered in five days. I was particularly careful in watching the effect of this remedy, and noted with much satisfaction the relief gradually given by it to the "splitting" headach (as he termed it), and that painful tightness and sense of constriction in the head, for which, a few years ago, I should have at once ordered the application of leeches, and which I should have regarded as most positively forbidding the smallest quantity of quinine.

After this the hepatic symptoms gradually yielded to local treatment and constant free purgation. The patient's constitution being, in my opinion, half ruined by mercury, I never allowed him to use it in any shape, as he had been salivated again and again, taking calomel in fifteen grain doses, as he declared, till his tongue hung out of his mouth. Few things in my professional career have afforded me such heartfelt satisfaction as witnessing this fine young man's embarkation for home with renewed hope and spirits. The hot season was so far advanced, that I made him go round the Cape. He recovered perfectly, and a few weeks ago I saw his appointment to a sloop of war.

I have been favoured with the details of some fatal cases of fever which occurred in the Ionian Islands within the last few years, and under the care of an officer who has since been serving in this command, where he has had ample opportunities of seeing and practising the quinine treatment. The details of these cases are precisely similar to those so common here; and my friend assures me that he considers the treatment he now follows would be found perfectly applicable in his former station, and adds that a knowledge of it would have enabled him to save many lives. The means he employed unsuccessfully were those commonly used,—depletion, purgatives, diaphoretics, and mercury. The use of quinine was considered, he states, inadmissible in patients presenting such high febrile action,—the very state of things which, in Ceylon, it is given to remedy.

If the perusal of the cases I have given above (to which, did not my limits forbid, I might add many more) should induce* others to follow the plan, I beg to remind them that no delay should take place in giving the quinine boldly. It is not an infallible remedy; and where I have seen it fail, the general cause has been the allowing the fever to get a-head for some days before employing it. Of course I do not advise any empirical blind use of it; due regard must be paid to circumstances which may aid or oppose its taking proper effect. Pure air, and plenty of it, with careful nursing, are great auxiliaries.

During some years, although a great many fever patients have passed through my hands, and been treated on this plan, I have only failed with it twice; in one case, a man of broken constitution (not from intemperance), and who had had ague so constantly, that he cared nothing for it. Quinine had no effect whatever in averting the fatal result, the patient's whole body became deeply yellow, and he died in coma on the seventh day. This gentleman, it must be added, had fever upon him for some days, but neglected it, expecting it would end, as he said, "in a good shake." He never had the slightest headach, or any pain whatever, beyond an aching in the loins and thighs.

In another case, which occurred to me this year, the patient was also a man who had lived hard, and done a great deal of work in the West Indies and other hot climates. His fever began with very mild symptoms, and was attended to from the first. Under the use of quinine, he seemed free from every ailment but debility, and yet no entreaty could prevail on him to take food. Gradually fever crept on, till it became ardent and continued; extreme debility, stupor, irritability of stomach, and a hot, dry skin, were the prominent symptoms, and quinine seemed powerless to save him. Under these circumstances, I gave him a bottle of Warburgh's fever drops (which I had had in my possession for nine years nearly), according to the directions laid down for its administration; a free perspiration followed, during which I still continued the quinine, and from that day amendment commenced, and he slowly recovered. What share the quinine had in this I do not know; it was steadily continued; but certainly, when the other means were used, it seemed highly improbable that the patient would survive forty-eight hours; and my opinion is, that without them the case would have been fatal. I have heard it reported several times that the remedy in question proved efficacious in such cases, but never had any personal experience of its effects before. It may, however, be useful to bear it in mind. The perspiration was evidently due to its action, for, when administered, the skin was perfectly hot and dry, and had been so for some days.

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* Judging from my recollections of fevers at home, I think I have seen many cases to which this treatment would be applicable. The remittent type is often seen in autumnal fevers, I believe.

Point de Galle,
Ceylon, 14th August 1848.

ART. V.—*Additional Notes on the Sickness and Mortality among the Emigrants to Canada in* 1847. By THOMAS STRATTON, M. D. Edin.; Surgeon, Royal Navy, Particular Service. In a Letter to Sir William Burnett, M. D., K. C. H., Director-General of the Medical Department of the Navy.

IN the Edinburgh Medical and Surgical Journal for July 1848 (in a communication dated 1st January), I offered a few observations on the above subject, and the defects in the method of conducting emigration. In speaking of the expense of the emigrant-hospitals in Canada, I mentioned L.100,000 sterling as then being the amount. However, on the 2d of March, it was officially announced in the Legislative Assembly, that, for the relief of emigrants, from May 1847, there had already been expended the sum of L.148,000 currency, and about L.12,000 more remained to be paid. Besides this total of L.160,000 currency, or L.131,000 sterling, the expense of the emigrant-hospitals for ten weeks more, up to the middle of May 1848, properly belonged to the season of 1847. The whole of the above expense was paid by the Home Government.

The following tables will probably interest the reader.

TABLE 1.—From a list of 420 emigrant ships I extract the following:—

Date of arrival at Quebec, 1847.	Ship's name.	Whence.	Length of pas to quar., days.	Detention in quar., days.	Total passengers.	Deaths on board.		Deaths in the quarant. hosp.	Total deaths.
						On passage.	In quarantin.		
May 20	Syria . .	Liverpool	46	6	242	9	0	40	49
... 25	Wandsworth	Dublin	42	6	527	51	0	53	104
June 7	Royalist .	Liverpool	31	15	437	26	0	10	36
... 8	Achilles .	...	39	14	411	42	0	9	51
... ...	Clarendon .	...	52	15	281	18	0	36	54
... ...	Scotland . .	Cork .	40	16	564	60	34	72	66
... 10	Congress .	Sligo	39	8	217	38	10	6	154
... ...	John Francis	Cork .	42	19	300	16	7	46	69
... ...	Wolfville .	Sligo	29	17	311	37	16	32	85
... ...	Agnes . .	Cork .	44	18	430	29	35	96	60
... ...	John Bolton	Liverpool	40	19	578	72	35	34	141
... 12	Bee . . .	Cork .	39	17	352	77	29	59	165
... ...	George . .	Liverpool	39	21	397	40	35	75	150
... 20	Sisters . .	...	44	14	507	58	44	17	119
... 23	Ajax . . .	...	46	22	359	36	33	18	87
... 24	Lotus . .	...	53	17	546	50	22	20	99
... 29	Sobraon .	...	32	20	606	31	16	20	67
July 1	Rose . . .	...	54	21	384	52	47	40	139
... 12	Wakefield .	Cork .	37	8	398	26	9	37	72
... 14	Lively . .	...	39	10	189	31	0	14	45
... 18	Goliah . .	Liverpool	54	4	600	41	20	28	89
... 19	Sarah . .	...	44	7	255	31	0	39	70
... 23	Erin's Queen	...	42	10	493	45	20	71	136
... 24	Jessie . .	Cork .	41	10	409	36	7	40	83
... ...	Triton . .	Liverpool	61	10	462	93	10	83	186
... 26	Avon . . .	Cork .	54	13	552	136	26	84	246
... 29	Greenock .	Liverpool	32	8	816	12	26	42	80
Aug. 7	Sir H. Pottinger	Cork .	60	10	400	98	7	22	127
... 9	Odessa . .	Dublin	53	8	242	22	4	49	75
... ...	Covenanter .	Cork .	50	9	400	43	16	71	130
... 10	Naomi . .	Liverpool	45	11	421	78	31	87	196
... ...	Yorkshire .	...	50	12	416	43	10	27	80
... 12	Virginius .	...	63	13	476	158	19	90	267
... 13	John Munn	...	47	10	452	59	11	117	187
... 14	Free Trader	...	46	7	481	40	13	85	138
... 20	Larch . .	Sligo	29	11	440	110	24	62	196
... 21	Ganges . .	Liverpool	58	8	393	45	9	44	98
... 22	Saguenay .	Cork .	64	14	476	104	4	47	167
... 28	Champion .	Liverpool	42	4	422	29	0	65	94
... 29	Bridgetown	...	52	5	471	74	24	63	161
Sept. 5	Julius Cæsar	...	52	2	460	33	0	20	53
... 17	Eliza	Glasgow	54	8	269	29	0	16	45
Oct. 3	Emigrant .	Liverpool	50	3	529	43	2	40	85
Nov. 1	Lord Ashburton	Liverpool	47	2	483	65	0	0	65

It appears by the above that the *Avon*, in 552 passengers, had 246 deaths; and the *Virginius*, in 476 passengers, had 267 deaths. In 1847, the earliest arrival of an emigrant ship at Quebec, was on the 8th of May, and the latest on the 8th of November. The shortest passage was 22 days, and the longest passage of an emigrant ship was 87 days, the average passage being 40 days.

The deaths on the passage were 5282, and, in quarantine, they were 3389; the total deaths, previous to arrival at Quebec, being 8671.

The number of emigrants landed at Quebec was 90,150; deaths previous to arrival at Quebec, 8671; births on the passage, 172; total, 98,993. This number of persons crossed in 442 ships, being at the average of 223 passengers for each ship.

Of the 90,150 emigrants, 696 were cabin passengers. Among the deaths on the passage, there were 11 deaths in child-birth.

TABLE 2.—The following table shows the Comparative Mortality among Emigrants from Different Countries.

From	*Number embarked.*	*Mortality per cent.*
Scotland,	3,239	3·12
England,	32,579	12·91
Liverpool,	27,051	15·39
Ireland,	54,329	7·86
Cork,	10,174	18·73
Ireland, including Liverpool,	81,370	10·49
Continental Europe,	7,525	1·26

The great mortality among the Cork emigrants, and in those sailing from Liverpool, and who were chiefly Irish, is very striking, compared with that among those from the Continent and from Scotland. If the mortality among those from England, exclusive of Liverpool, were shown, it would be similar to the Scotch and German mortality.

For the preceding tables, and for some of the other information in this paper, of which the source is not otherwise specified, I am indebted to the kindness of Mr Buchanan, Chief Emigrant Agent.

TABLE 3. Shows the Weekly Mortality in the Emigrant Sheds at Grosse Isle.*—1st week, 1 death; 2d, 16; 3d, 71; 4th, 119; 5th, 154; 6th, 202; 7th, 156; 8th, 144; 9th, 165; 10th, 171; 11th, 197; 12th, 188; 13th, 220; 14th, 322; 15th, 288; 16th, 256; 17th, 191; 18th, 143; 19th, 133;

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* An island thirty-two miles below Quebec.

20th, 121 ; 21st, 86; 22d, 61 ; 23d, 33; and 24th week, 14 deaths.

The details which follow, relating to Grosse Isle Quarantine-Hospital, are from a report by Dr George Douglas :—

Table 4, year 1847.—Number of emigrants arrived, 98,106; number admitted to hospital, 8691 ; per-centage of admissions, 8·86 ; number of deaths, 3238 ; per-centage of deaths, 37·36 ; cases of fever and dysentery, 8574 ; per-centage of fever and dysentery, 8·74 ; small-pox, 92 ; per-centage of small-pox, 0·09 ; cases of other diseases, 25 ; per-centage of other diseases, 0·33 ; total admissions, 8691.

Table 5. Shows the number and per centage of disease. and mortality of emigrants at the Grosse-Isle Quarantine Hospital, from 1833 to 1847, both years included.

Year.	Emigrants arrived.	Admitted to Hospital.	Per cent. of admissions.	Deaths.	Per cent. of deaths.	Diseases.			
						Fever and dysentery.	Small-pox.	Other Diseases.	Total.
1833	22062	239	1·08	27	11·30	159	34	46	239
1834	30982	844	2·72	264	31·16	404	12	138	844
1835	11580	126	1 08	10	7·93	24	48	54	126
1836	27986	454	1·62	58	12·78	338	50	66	454
1837	31894	598	1·87	57	9·53	481	104	13	598
1838	2918	65	2·23	6	9·31	42	17	6	65
1839	7214	189	2·62	9	4·76	147	1	41	189
1840	22065	561	1·54	41	7·31	485	60	16	561
1841	28060	290	1·03	38	13·41	184	32	9	290
1842	44374	488	1·09	54	11·07	340	56	74	488
1843	20714	245	1·18	19	7·75	173	26	46	245
1844	20142	388	1·92	17	4·38	322	11	55	388
1845	24640	465	1·88	30	6·45	362	73	30	465
1846	32753	892	2·72	66	7·40	613	106	107	892
1847	98106	8691	8·86	3238	37·26	8574	92	25	8691

In 1834 there were 290 cases of cholera among the emigrants.

Table 6. Shows the number of emigrants admitted, discharged, and died, in the Grosse Isle Quarantine Hospital, from May 1847 to 3d November 1847.

	Admitted.	Discharged.	Died.	Fev. & Dys.	Sm.-pox.	Oth. dis.
Men,	3534	2173	1361	3515	15	4
Women,	2763	1794	969	2730	20	13
Children,	2394	1486	908	2329	57	8
Total,	8691	5453	3238	8574	92	25

In consequence of the great prevalence of fever and dysentery, it was found necessary to restrict the admissions as much as possible to these diseases and small-pox.

Table 7. Shows the number of medical men, clergymen, hospital attendants, and others, who, in 1847, in attendance upon sick emigrants at Grosse Isle, contracted fever and died.

	No. who attended the hosp.	No. who contracted fever.	No. who died.
Medical men, - -	26	22	4
Roman Catholic Priests, -	42	19	4
Clergymen of the Church of England,	17	7	2
Hospital stewards, - -	29	21	3
Nurses, orderlies, and cooks, -	186	76	22
Policemen, - -	10	8	3
Carters for removing the dead, -	6	5	2
Clerks, bakers, and servants, -	...	19	4
Deputy-Emigrant-Agent, -	1	1	...
Clerk to ditto, - -	1	1	...
Custom-house officers employed to examine baggage, - -	2	1	...
Servants of Roman Catholic clergymen,	8	4	1

Nearly all the nurses, orderlies, and cooks, that came from Quebec and Montreal, contracted fever; many of the nurses, &c. were emigrants convalescent from fever, otherwise the proportion of attacks among them would have been greater.

Table 8. Shows the average daily number of sick during each month of the season of 1847.—May 15th to 31st, 451; June, 1508; July, 1454; August, 2021; September, 1330; October 1st to 21st, 346; average daily number of sick during the season, 1307.

Table 9. To show the great increase in the number of admissions to the Quebec Marine and Emigrant Hospital, I give the number for previous years:—

From 1st Jan. 1844, to 31st Dec. 1844, 940 admissions;
...... 1845, ... 1845, 1434 ...
...... 1846, ... 1846, 1714 ...
From 1st Jan. 1847, to 16th Oct. 1847, 4705 ...

Table 10. Shows the monthly mortality in 1847 in the Quebec Marine and Emigrant Hospital.

1st to 31st May, 8; June, 93; July, 295; August, 404; September, 204; October, 123; 1st to 20th November, 17.

Table 11. The following is the report of the Quebec Marine and Emigrant Hospital, by Drs Painchaud and James Douglas, from 1st May 1847, to 30th November 1847.

Admitted, 4872; discharged, 3550; died, 1212; remaining,

110. Seamen, 1371; emigrants, 3313; town's people, 188. Fever, 3657; rheumatism, 60; other diseases, 912; total number of medical cases, 4629. Fracture, 33; syphilis, 107; other surgical diseases and injuries, 103; total number of surgical cases, 243.

I imagine that among the "discharged" are reckoned 200 or 300 who were discharged sick to the Montreal Emigrant Hospital, for the purpose of making room to accommodate the sick from Grosse Isle, when it became too late in the season to occupy the latter hospital.

TABLE 12.—To show how widely throughout Canada the emigrant-sickness extended, I give the following list of places where emigrant-hospitals or boards of health were established, with the number of admissions, &c., from the beginning of the season in 1847 to the undermentioned dates, when most of them were closed.

PLACE.	Up to what date, 1847.	Admitted.	Discharged.	Died.
Cornwall (Canada East),	Nov. 4	234	182	52
Matilda,	„ 1	28	22	6
Prescott,	Oct. 31	225	181	44
Brockville,	„ 6	130	99	31
Bytown,	Sep. 30	1440	1089	351
Kingston,	Oct. 31	4206	3137	1069
Belleville,	„ 3	371	269	102
Picton,	„ 5	36	31	5
River Trent,	Sep. 17	39	34	5
Toronto,	Oct. 31	3300	2543	757
Oakville,	Sep. 11	20	16	4
Newmarket,	„ 30	90	71	19
West Williamsbury,	Nov. 5	111	85	26
Barrie,	Aug. 28	5	3	2
Niagara,	Nov. 6	150	115	35
Queenston,	Oct. 1	27	21	6
St Catherine's,	Oct. 31	217	174	43
Hamilton,	„ 5	1123	822	301
Brandford,	Nov. 1	330	281	49
London (Canada West),	Nov. 3	274	206	68
Total,		12,356	9,381	2,975
Up to February 1848 from various other places in Western Canada where temporary Boards of Health were established,		2872	2042	830
Grand Total,		15,228	11,423	3,805

The expense of the above for medical men, medicines, diet, &c., amounted to L.27,885 currency.

At St John's, Canada East, the emigrants admitted were 172; discharged, 101; and 71 died.

At Lachine, the number admitted was 342; discharged, 212; and 130 died.

Besides the above returns, a great many emigrants died in taverns, lodging-houses, and on the road, as well as at places in the interior, of all which mortality no kind of estimate can be made.

TABLE 13.—The following is the return of the Montreal Emigrant Hospital, from May 1847 to 31st January 1848.

Admitted, 10,189; discharged, 6734; died, 3330; remaining, 125.

Dr Liddell informs me that about 3000 admissions ought to be added to the above, some of the earlier admission books having been lost. Of these 3000, many died, but not quite in so large a proportion as the above.

TABLE 14.—The following are Dr Long's returns of the Montreal General Hospital.

For the quarter ending on	Admitted.	Died.	Common continued fever and typhus.
31st January 1847,	394	9	78
30th April „	319	11	42
31st July „	860	113	631
31st October „	890	82	499
31st January 1848,	496	48	...

TABLE 15.—In Lower Canada the young orphans in numerous instances were kindly provided with homes by the Roman Catholic clergy, inducing farmers and others to adopt them. The following report by Mr Townsend, of the Toronto Emigrant Convalescent House, from 6th August 1847 to 29th February 1848, shows the number of orphans and widows consequent on the great mortality among the emigrants.

	Admitted.	Remaining on Feb. 29, 1848.
Men (over 18 years),	621	64
Women do.	475	61
Boys (under 18 years),	477	23
Girls do.	487	35
Destitute of Parents,	164	1
Destitute of Fathers,	273	6
Destitute of Mothers,	79	18
Widows whose husbands have died since embarkation,	88	3
Scotch,	34	1
English,	8	0
Irish,	2622	190
Total,	2664	191

Second Attacks of Typhus.—I heard of a good many instances of this; but, compared with the great number of typhus cases, they did not amount to more than a very small exceptional number.

Treatment of Typhus.—Towards the end of the season, the method of treatment with nitric acid, and alcohol in its various forms, and other stimulants, was found to be much more successful than other methods; but it is not very clear whether or not this greater success arose partly from any change in the character of the disease, as compared with what it may have been in the earlier parts of the season.

Emigration.—With regard to the subject of emigration in general, it is evident that an extensive, methodical, and well-conducted system of emigration is what the mother country now requires; and as to the colony to which emigration should be encouraged, there is the economical reason for sending emigrants to British North America, rather than to the Australian colonies, that the same sum which it costs to send one person to the distant Australian colonies, would convey three persons to the much nearer colony of Canada: also, if a settler is disappointed and wishes to return, it is much easier for him to do so from Canada than from Australia.

There are also political reasons why the British government, instead of promoting emigration to Australia, should rather encourage a flow of British settlers to Canada, a colony which contains a great number of inhabitants of another race, and which is bounded to the south by the United States. In the event of internal disturbances, it is unnecessary to allude to the advantage of having a preponderance of British settlers, and, in case of war, of having a well-peopled colony to repel invasion.

Montreal, Canada,
August 1848.

ART. VI.—*Cases of Dysentery treated by Enemata of Warm Water.* By JAMES IRVING, M. D., Assistant-Surgeon, Bengal Army.

THE following cases afford examples of a practice recommended by Dr O'Beirne of Dublin, in a work published in the year 1822 ("New Views of Defæcation, &c."), and which has lately been revived in India by Assistant-Surgeon Hare, of the 7th Bengal Irregular Cavalry, in a pamphlet published during the present year ("Hints for an improved Treatment of Remittent Fever and Dysentery." Delhi, 8vo. Pp. 36.) Before relating the cases, it may be as well to detail briefly the rationale of the practice.

It is well known that in dysentery, fæcal accumulations are apt to occur at the sigmoid flexure of the colon, and at the *caput cæcum*, and that the lodgment of these masses, to quote the words of Annesley, tends "very evidently to irritate and inflame the mucous surface on which they lodge, and cause ulceration and even sphacelation in a very short period, if neglected or injudiciously treated." (Researches on the Diseases of India, vol. ii. p. 152.) Hence, in the treatment of the disease, purgatives have been pretty generally recommended by authors and practitioners; and various drugs of this class have been employed, many of them of an irritating description. Annesley used to prescribe twenty grains of calomel at night, and a black dose in the morning. Bampfield, another author of very varied experience in the treatment of dysentery, gave eight or twelve grains of calomel twice or thrice a day, till salivation and purgation were produced; and, to ensure a full purgative action, used also to give thirty grains of jalap, or an ounce of salts. He occasionally purged with extract of colocynth and infusion of senna. Purgatives are also recommended as an important part of the treatment, by Curtis, Wade, Ballingall, Lempriere, and Twining, all of whom saw much of the disease within the tropics; and there are few writers who do not advise the occasional use of laxatives as a part of the cure. The difficulty commonly experienced is, to fix on the proper period for their administration, and to give such as will act effectually and mildly, without irritating the inflamed mucous membrane. For this purpose, Dr O'Beirne recommended the injection of a quantity of warm water through an elastic tube, passed above the sigmoid flexure; and he affirms that, by this means, the bowels are effectually opened, and accumulated fæces are removed, while the warm water rather soothes than irritates the inflamed membrane; and that, moreover, the effect is produced much more speedily than by purgatives given by the mouth,—only a few minutes being required. He shows that in dysentery, besides the mechanical obstruction to fæces in the twisting of the colon at the sigmoid flexure, there are other obstacles, such as, the contraction of the gut from spasm, and swelling of the inflamed membrane; while the fæcal accumulation, by impeding the circulation below it, causes further swelling, which may be to such an extent as to give rise to *prolapsus ani*.

In order to administer the enema as recommended by O'Beirne and Hare, the patient lies on his back, and the elastic tube of Reade's or Weiss's stomach-pump is passed through the anus, and carried gently onwards for about nine inches, when the end will reach the flexure; warm water, or milk and water, of the temperature of 90°, and in quantities varying from three to six pints, is then pumped into the bowels, which may be observed to become gradually distended. On withdrawing the tube, and if the patient can bear it, he should be laid on his left side, or have his belly gently rubbed and pressed. On his going to stool the injection is returned, and generally procures a free fæculent evacuation. By means of the pumping, the water is intimately mingled with any accumulations; and the tube, by being moved from side to side, or gently up and down, assists more effectually to break up hardened masses. The water, in fact, thus performs the part of those fluid secretions which the accumulations cause the intestines in cases of dysentery to throw out, and which soften and break them down, and thus procure their gradual discharge. Purgatives must act in a similar manner, by soliciting from the intestines fluid secretions, which act on scybala in a similar manner. Mr Hare observes—"By the first injection, some fæcal matter, at least, will be softened and removed, and the injection can be applied again and again, till the relieved intestine eject itself the harder matters, reduced as they must be in size, if any remain." P. 26.

In chronic dysentery, where we have either ulcers or great irritability of the colon, this remedy would seem likely to prove serviceable. It is found to be a good laxative, removes ill-digested fermenting fæces from the delicate mucous membrane; and, by means of it, the swollen or strictured gut can be gently distended with a bland fluid, while it also affords a ready means of applying astringents to ulcers of the intestines. But in chronic dysentery this practice presents another advantage, pointed out by Mr Hare, viz. that we can sooner give tonics and generous diet, because, when the intestines are thus regularly washed out, we do not fear the presence of fermenting ill-digested food. When ulcers exist, and it is wished to employ astringent lotions, Mr Hare first washes out the intestines, and then throws up the medicated enema. Those substances from which he has derived most benefit, are fifteen grains of nitrate of silver dissolved in two pints and a half or three pints of water, a strong decoction of bark, or a mixture of catechu and chalk.

This plan is now extensively adopted in Bengal, and has been used to some extent in the Artillery Hospital at Subathoo, where I have had an opportunity of judging of its effects. In using the tube of the stomach-pump, it is advantageous to close the holes at the side of the extremity of the tube, and to bore a large aperture at the end, so that a stream of water may be directed forwards with some degree of force. It also appears to be of great importance to have the warm water as long as possible in contact with the mucous membrane, so as to foment its tender surface; hence the patient should try to retain it as long as possible. But to the enema I often add, with advantage, a few drops of laudanum and a few grains of acetate of lead, which exert an astringent as well as sedative action on inflamed parts. The good effects of this plan, as personal experience enables me to testify, are often striking. A patient who before has had frequent small stools, accompanied by pain and tenesmus, after the enema has a copious fæculent motion without tenesmus, and from this time the evacuations become less frequent, contain less blood, and by the daily repetition of the injection, with scarcely any other remedy, a cure is produced. In other cases, as those in which the liver is affected, the relief is merely temporary; and a few cases occur in which the use of the remedy seems to add to the uneasiness of the patient, to increase the frequency of the stools, and the violence of the straining. It is proper to remark, that although, as in all stations in the Himalayas at this season, bowel complaints have been common, yet no very severe case of dysentery has occurred at Subathoo; and consequently this practice has only been tried in the comparatively mild cases which have occurred. In two chronic cases, in which it was used, it proved of little avail; the administration first of a warm water enema, followed by one of nitrate of silver solution, rather adding to the discomfort of the patients; but perhaps both of them had suffered too long from chronic dysentery to admit of benefit from any remedies; and after death the colon in each was found to contain one mass of ulceration.

The following testimony, however, as to the success of this method in a case of some standing, is well worthy of notice. Surgeon Baddeley of the Artillery thus relates his own case in the 3d number of the India Register of Medical Sciences:—"Mr Hare's plan of administering hot water injections in cases of dysentery, is, I think, likely to prove a most valuable therapeutic agent in that hitherto intractable complaint. The effect of its operation in my own case was remarkable, for it produced what may be considered a cure after the third application. My disease had continued for near five months, and though at the time of my making trial of the plan, it had assumed a milder form, the motions still numbered about eight daily, and were generally mixed with bloody albuminous matter. After the third application of the hot water, the frequency of the motions was sensibly diminished, and the bloody secretion ceased, and the bowels appeared to have suddenly resumed almost entirely their healthy function. It is now nearly a month since I used the remedy, for I have continued so well ever since, that I have not thought it necessary or advisable to repeat it again. I have for the last month given the plan a further trial in hospital practice, both for Europeans and natives, and with apparently favourable results. I have likewise found decided advantage from its application in mild forms of *delirium tremens*, and the after effects of dram-drinking. The injection in these cases has always been preceded by an emetic, and the rapidity with which the debilitated nervous system is restored by this plan is most marked."

In the same Journal, Captain Richardson of the 73d Regiment, N. I. writes thus:—" My dysentery commenced June 1847, and continued uninterruptedly with great reduction of strength till January 1848, during which time I took purgative pills and laudanum, the latter daily, without any but temporary relief. I was indeed in the habit of keeping a lump of opium by my side, which I constantly used, and, from constant purging, could not venture from my house without it. In January 1848, after the arrival of my regiment at Lahore, I saw Dr Hare, who for some time treated me with a variety of medicines, according to the old routine, without the least benefit. He then recommended that I should try his new method, which he explained by lending me his book. I passed the tube without the slightest inconvenience or pain, and it brought away such an enormous stool, that I nearly fainted. I had strong purgatives previously, which quite failed to bring away this large accumulation. From that moment I felt great relief, and continued to improve in health and strength to the present time (11th February 1848), occasionally only using the injections, and am able to take active and even violent exercise."

Case 1.—The first case which I shall give is one, in which warm water enemata seemed to prove very beneficial in arresting the disease.

Sergeant D. G., aged 30, 6th Battalion, Artillery, was admitted into hospital on the 29th July with tertian fever, from which he recovered in a few days; but, on the 11th August, he complained of griping, with small frequent stools, consisting chiefly of blood and mucus. For this he took five grains of blue pill with half a grain of opium, followed next day by a dose of castor-oil, and also Dover's powder on the 12th, 13th, and 14th. But the griping, tenesmus, and small bloody stool continued. On the morning of the 15th, an enema of four pints of warm water with seven grains of acetate of lead was administered.

August 16*th*.—The enema administered yesterday brought away a full fæculent stool along with several scybala; he passed no blood, and the bowels have not since been moved.

Enema to be repeated.

Vespere.—The injection brought away a large accumulation of hardened fæces. No stool since; feels quite easy.

18*th*.—The bowels were now quite natural, and he had no longer tenesmus or pain, but continued a few days longer in hospital on account of rheumatism.

Discharged 21st August.

Case 2.—Gunner H. M., aged 25, 2d Brigade, Horse Artillery, 4¾ years in India, admitted 5th August 1848, with dysentery. States on admission that he has had diarrhœa for a fortnight, and that since yesterday he has had very frequent calls to stool, with tenesmus. Has had about forty stools to-day, consisting principally of blood and slime. Tongue red on the edge; pulse 92.

Ten grains of calomel with one grain of opium were ordered to be given in the form of pill at the hour of repose. The diet to consist of sago.

August 6th.—Has had very frequent calls to stool during the night; stools greenish, and mixed with mucus and blood.

Two scruples of the compound jalap powder were ordered to be taken immediately; and after the interval of five hours, an enema of warm water to be administered.

Vespere.—Felt much relieved after the enema, which brought away a few scybala; stools less frequent, with less blood. Hab. enema anodyne.

7th.—No motion since last evening. Slept well; free from pain, but feels very weak. Pulse 84.

The enema of warm water with six grains of acetate of lead to be again administered; arrow-root for diet.

Vespere.—Only four stools since the enema this morning; a few hardened knots of fæces.

8th.—Four bilious stools in the night. Little or no tenesmus. Pulse 76; tongue natural; appetite good; enema to be repeated.

9th.—Two stools after the enema yesterday; no blood.

A draught, consisting of one ounce and a-half of the infusion of chirayta (*Gentiana Chirayta*) with four grains of bicarbonate of soda, was directed to be given three times daily.

Low chicken diet.

10th.—Two feculent stools yesterday, of better consistence. Continue half-chicken diet.

Vespere.—One natural stool.

12th.—Discharged.

Case 3.—Bombardier D. D., aged 35, 4th Battalion, Foot Artillery. Admitted into hospital under Surgeon Tritton, 25th June 1848, with dysentery; twelve years in India. State on admission:—bowels much relaxed; had about thirty stools yesterday, passed with gripings, and containing blood and mucus. Tongue white, with red edges; pulse 96; abdomen soft and tender generally, especially around the umbilicus; stools muco-purulent, with blood.

Twenty leeches were ordered to be applied to the umbilical region; and an enema, consisting of two pints and a-half of warm water, to be administered at 2 P.M.

Spoon diet.

Vespere.—Pulse 80, soft; has been much easier since taking the enema. Bowels very freely moved; stools pale, fæculent, with blood.

June 26th.—Pulse 96; fourteen or fifteen stools since last report, very slightly tinged with blood; griping and straining much less; thirst; no appetite.

The enema to be repeated, and to have, immediately, a draught consisting of one drachm and a-half of Rochelle salt (tartrate of potassa and soda), half a drachm of gum in powder, and half a drachm of tincture of opium and camphor in one ounce and a half of peppermint water.

27*th.*—Pulse 78; tongue red; thirst; no pain; four loose stools, fæculent, with undigested matter mixed; no griping; slept well.

Enema to be repeated. Sago diet.

Vespere.—Pulse 74; stools five or six, fæculent.

To have, at the hour of repose, four grains of blue pill and one grain of ipecacuan powder in the form of pill.

28*th.*—Pulse 74; tongue more natural; thirst nearly gone; two fæculent stools, imperfectly digested. Enema to be repeated.

29*th.*—Pulse and tongue natural; no pain; slept well; no stool since yesterday morning. Half-chicken diet.

30*th.*—One healthy evacuation; no pain or uneasiness; appetite good.

To take, twice daily, a draught consisting of one ounce and a half of the infusion of chirayta with ten drops of dilute nitric acid.

July 1*st.*—No complaint. One pint of beer.

2*d.*—Discharged.

Case 4.—Sergeant R. P., aged 30, 1st Battalion, Foot Artillery. Admitted 3d August 1848, with dysentery. States that he has had diarrhœa above a fortnight; but latterly his stools have been very numerous (twenty yesterday), and he has been passing blood and slime with much tenesmus. Slight pain over the cæcum; skin hot; tongue white.

To have, at the hour of repose, a pill consisting of ten grains of calomel, one grain of ipecacuan, and one grain of opium; after the lapse of four hours, half an ounce of castor-oil; and in the evening to have ten leeches applied over the right iliac region. One drachm of laudanum with six grains of acetate of lead in two ounces of cold water to be administered in the form of enema.

August 4*th.*—Less tenderness over the cæcum; pulse 84, small; fifteen stools in the night, fæculent, bilious, with much blood and mucus. Tongue moist; great thirst; tenesmus.

To have an enema of three pints of warm water; six grains of ipecacuan powder with five grains of mercury and chalk to be given immediately; and in the evening, six grains of Dover's powder with three grains of mercury and chalk.

5th.—Felt much relieved yesterday after the enema, which he retained for ten minutes, and afterwards having a fæculent easy motion. Had a bad night; twenty stools; tenesmus; motions fæculent, mixed with blood and mucus; tongue furred.

Enema of warm water to be repeated; six grains of ipecacuan with three of extract of hyoscyamus to be taken immediately, and repeated after an interval of six hours.

Vespere.—Feels easier after the enema; always vomits after taking ipecacuan in any form or dose; considerable tenesmus. An anodyne enema to be administered.

6th.—Had a better night; two stools, freer and more natural. Sago diet.

To have immediately two scruples of compound jalap powder.

Vespere.—Seven stools during the last three hours; consist of fæces with mucus and blood passed, with tenesmus.

An enema of two pints and a-half of warm water to be administered with forty minims of laudanum and four grains of acetate of lead.

7th.—Three stools after the enema; no pain; very slight tenesmus; stools more fæculent, with a mere trace of blood; pulse of better strength.

To take two scruples of the compound rhubarb powder, and, after the interval of six hours, the enema with laudanum and acetate of lead to be repeated.

8th.—Two small fæculent stools in the night; no tenesmus nor pain; no blood. He retained the enema half an hour yesterday, and felt much better afterwards.

The enema with four pints of warm water, forty minims of laudanum, and six grains of acetate of lead, to be repeated. Low chicken diet.

9th.—Three natural fæculent motions free from blood after the enema yesterday. Two stools in the night; bilious, fæculent, streaked with blood.

To have three times daily a draught consisting of two ounces of infusion of chirayta and five grains of carbonate of soda. The enema to be repeated.

10th.—One stool after the enema; one ill-digested stool in the night.

To have immediately one drachm of the compound rhubarb powder. The draught to be continued. Half chicken diet.

12th.—Nearly well; bowels are becoming regular. The draught to be continued.

14th. One natural stool this morning; feels better than he has done for four months past; gains strength. The draught to be continued.

16th.—Discharged.

Case 5.—Gunner C. H., 6th Battalion, Foot Artillery, aged 30; two years five months in India. Admitted 20th August 1848. States that he has had looseness of the bowels for a week past, and has latterly passed nothing but small, white, slimy stools, with much tenesmus. Complains of tenderness in the course of the colon, but chiefly at the cæcum. Great thirst; no appetite. Has been at stool several times in an hour all yesterday and last night. Tongue dry in the mornings, now moist and red; pulse 88.

To have immediately an enema consisting of four pints of warm water with eight grains of acetate of lead and forty minims of laudanum. Spoon diet.

Vespere.—Felt much relief after the enema; stools since fæculent; less tenesmus. Enema to be repeated.

August 21st.—Four stools since the enema of last night, greenish, mixed with fæces; no blood or tenesmus; slight tenderness over the sigmoid flexure.

The enema to be repeated, with the addition of four ounces of infusion of ipecacuan. Milk diet.

Vespere.—Two stools before, and four since, the enema; a quantity of fæces came away; nearly free from pain in the sigmoid flexure; no tenesmus.

22d.—Twelve pale-yellow fæculent stools in the night; no pain nor griping; pulse 80.

To have immediately five grains of blue pill and one grain of opium.

23d.—Two stools yesterday; two in the night; bilious.

To have one drachm of the compound rhubarb powder. Low chicken diet.

24th.—Half diet.

27th.—Discharged.

Allusion having been made to various diets, I may briefly state that a man on half-diet gets eight ounces of mutton, one pound of bread, butter, tea, and four ounces of rice, besides various condiments and spices. The only difference in half-chicken diet is that the patient gets chicken instead of mutton. A man on low diet is allowed the soup from either eight ounces of mutton or a chicken, eight ounces bread, with tea, spices, &c. Milk diet is composed of one pound of bread, two pints of milk, butter, and six ounces of rice. Spoon diet consists of eight ounces of bread, or four ounces of sago, tea, and rice-water.

Subathoo, 29th August 1848.

Art. VII.—*Case of Ovarian Cyst Accidentally Ruptured by a Blow; Partial Effusion of Contents into Peritoneal Cavity; Violent Acute Peritonitis terminating Fatally eleven weeks afterwards; Post-mortem Appearances, and Chemical Examination of the Contents of the Cyst.* By William Bird Herapath, M. B., London, M. R. C. S., &c., Surgeon to St Peter's Hospital, Consulting Accoucheur to Bristol Dispensary and Dorcas Society.

The accompanying case is worthy of record, as it presents several features of peculiar interest. Cysts of the ovary are still of very doubtful origin, and their occurrence is not, fortunately for our patients, an event of every day practice. It therefore behoves us to pay particular attention to every example within our reach, in order that, by comparison with others on record, we might eventually obtain a clearer insight into their pathology and physiological origin.

The short time which this poor patient was under my care prevented me from making any accurate diagnosis. The existence only of a tumour in the hypogastric region was ascertained; that this was uterine or ovarian I had very little doubt; but of what nature, it was impossible to conjecture;—the patient's debilitated and wretched state precluded all further examination. One very remarkable circumstance connected with it is the time elapsing between the rupture of the cyst and the death of the patient.

It is evident that it was ruptured at the time of the accident, from the state of collapse and the violent peritonitis subsequently arising; yet eleven weeks elapse ere life sinks under the effects of the injury. The evidence derived from the post-mortem examination is conclusive, and removes all doubt from our minds. The discovery of the old adventitious cyst, possessing almost cartilaginous walls, and containing within it a portion of the peculiar unctuous fat, identical in composition with that subsequently found in the ovarian cyst, proves distinctly that considerable time must have elapsed since the rupture. The peritonitis produced such extensive pathological changes, that it is really wonderful how peristaltic action could have been continued, as the functions of the peritonæum must have been completely interfered with.

The results obtained from the chemical analysis of the contents of the cyst are also fraught with interest, as they furnish a method of accurate comparison with similar cases; and it is only from such careful investigations that we can hope to obtain any insight into the origin of these mysterious diseases.

The fatty acids, &c. present in this substance do not differ from those usually found in the human subject. The existence of hairs and epithelial cells in this case, and the occurrence of teeth (also epidermoid appendages) in cases previously reported, are points worthy of especial remark. Had teeth ever existed in this case, they must have been found.

The adult appearance of the hairs is also an interesting fact;—it shows they were not of fœtal origin;—we can no more expect adult hair upon a fœtal cranium than we can hope to have "an old head on young shoulders." Does this lead to the conclusion that the ovaries are but a development of the common integuments? I am decidedly of opinion that this was not an ovarian fœtation; that it was not the result of a fœtus remaining in the ovary and subsequently entering into putrefaction and decomposition. My reasons are, *first*, that no bones were discovered in the contents of the cyst; *secondly*, there was not enough of carbonate and phosphate of lime even had these disintegrated; *thirdly*, the hairs were decidedly not fœtal but adult; *fourthly*, the earthy salts were distinctly traced to the epidermoid or epithelial cells.

Mrs Caroline Winterson, aged 23, was confined in March 1847, with her first child; the labour was premature, occurring at the seventh month of pregnancy; it was not a difficult one. The fœtus had been dead some days, as decomposition had commenced. She got up well.

About a fortnight after delivery she first discovered an enlargement in the right side of the abdomen, in the iliac region. This formed a tumour as large as an orange, and moveable, and painful, but not extremely so. This continued to increase slowly during the next twelve months, and the pain became more constant and severe; but she was still able to walk about with difficulty. Pain in the loins, and a sensation of weight and bearing down in the pelvis, were complained of.

About eleven weeks ago she fell down, and immediately experienced excruciating pains in the abdomen. She struck the tumour itself against the curb-stone. The accident produced faintness, vomiting, and great depression of the system, which did not leave her; and peritonitis appears to have been also induced. The acute stage passed off under appropriate treatment, leaving ascites behind, together with violent pain. Every movement of the intestines created a groan; she was never easy for a moment. The medical man in attendance gave her aperients, which acted violently upon her, and great debility ensued. The ascites slowly disappeared, but it was soon followed by anasarca of the inferior extremities.

When I first saw her, May 19, 1848, she was in a deplorable state of debility—in fact, almost moribund; the extremities were enormously distended by serous effusion; the ankles were as large as one's knees; the œdema extended upwards even to the lumbar region. The abdomen was not ascitic, but it was extremely painful, and would not bear manipulation. I ascertained the existence of dulness in the pubic and right iliac regions,—she was lying on the right side,—and the ill-defined margin of a tumour a little anterior to the usual position of the cæcum.

The pulse was scarcely perceptible, very quick and small, 164. The tongue was red and aphthous all over; there was great difficulty in deglutition from the same state in the fauces. The voice was dry and husky; a restless anxiety marked the countenance. She was evidently in great agony; incessantly moaning, and totally deprived of sleep; unable to remain ten minutes in the same position, yet incapable of moving herself into any other. The bowels were excessively purged; the evacuations running from her involuntarily, and of a most offensive character. The urine had passed with difficulty, but it was now much more free than formerly.

Under these circumstances but little could be done; death could not be far off. I simply prescribed a draught containing two grains of acetate of lead and three drops of Batley's sedative solution of opium every four hours, with wine, brandy, and arrowroot, as much as her stomach would permit.

She continued to sink day after day, although the diarrhœa was controlled by the medicine, and she obtained some rest; but death happily came to her relief, May 21, at 6 P. M.

Autopsy thirty-six hours after.

The body was extremely emaciated; the inferior extremities almost appeared to belong to a different person. Upon endeavouring to remove the abdominal parietes, they were found to be everywhere adherent to the surface of the intestines by blackened and gangrenous softened fibrinous adhesions; the greater omentum was nowhere to be found; it is possible that the omentum had formed part of the bond of union here described, and had subsequently become so altered by gangrenous softening as to be no longer recognised. The whole of the intestines were agglutinated together; there was not a single coil free from adhesions which were partially organized. The liver was adherent to the diaphragm by firm fibrinous deposit, evidently of some antiquity; at one part a cavity existed between these serous surfaces, bounded on every side by tough and firm false membranes, thus forming a cyst in which was contained sero-purulent fluid, with some lumps of fatty matter floating in it, similar to what was afterwards found in the ovary.

In the pelvis, extensive disease existed; the intestines, and a peculiar sac, to be described immediately, hid everything from view. Upon carefully destroying the fibrinous adhesions with the finger, at length the origin (*a*) of the disease was discovered. A large ovarian cyst on the right side, capable of holding a pint and a-half. A laceration existed in the superior part of it, but it was closed by the cæcum and a coil of small intestines adherent to its margins; this fissure was about three-quarters of an inch in length, and apparently not recent. The cyst contained sero-purulent fluid in quantity(*b*) (but the walls were flaccid); and floating in this fluid were masses of soft, yellowish-white unctuous fat, in which numerous hairs were imbedded; when all these masses were collected into one, it was the size of a small orange. (*c*)

This was carefully preserved for examination, as was that portion of similar matter found in the adventitious cyst between the liver and diaphragm. The cavity of the abdomen also contained some of this substance, together with a little sero-purulent fluid.

This ovarian cyst was immediately behind the bladder, filling the cavity of the pelvis pretty well, and rising by a pointed extremity on the right side above the brim; at this point the rupture had taken place, and it had subsequently become adherent to the cæcum. On its left side, its walls were glued to the sigmoid flexure of the colon; posteriorly it adhered to the rectum, anteriorly to the bladder, inferiorly it rested on the rectum, pushing the uterus in front and to the left; no remains of bones or teeth were to be seen.

Chemical Examination and Analysis of the Fatty Matter contained in the Cyst, for which I am indebted to my brother, Thornton John Herapath, Analytical Chemist, &c.

Physical Characters.—A yellowish-white, granulated, unctuous substance, having numerous hairs intermixed. It possessed a fetid sour smell; it floated on water; a few pus-globules only washed out of it. Its appearance was not unlike stale clotted Devonshire cream. When placed in water somewhat below 98° Fah. it was partially melted, and then had the consistence and smell of toasted cheese. It was still opaque.

The hairs were separated from the fat by enclosing the whole in a muslin bag, immersing this in boiling water, when pressure forced the liquid fat through the pores of the muslin, and the hairs remained in the bag. These were subsequently washed with ether.

The hairs were curly, light brownish-red in colour. Some were half white. Some had bulbous expansions, others were destitute of them; all were pointed at one extremity, and thicker at the other; some had two or three points, being double or triple hairs; some were two inches long, others not more than half an inch; a few were fine and silky, but the majority were more like the hair of the pubis or whiskers than those of an infant.

Chemical Examination (T. J. Herapath).—A certain quantity of the fat was heated in a water-bath at 212° Fah. so as to expel all moisture. It was then accurately weighed.

(*a*) The melted mass was then boiled repeatedly in pure anhydrous ether, until everything *soluble* in that menstruum was extracted. For insoluble residue vide (*e*). The mixed ethereal solutions were allowed to cool, and then thrown on a filter of white bibulous paper, and the residue repeatedly washed with cold ether. This residue was then carefully removed from the filter, from which any adhering particles were removed by means of boiling ether; it, together with the washings, were then exposed to a warm-bath to expel the ether. A transparent oily-looking substance remained, which, on cooling, solidified into a mass not unlike tallow in appearance and consistence. This was a fat, therefore, *soluble in boiling ether*, but *insoluble in cold.*

(*b*) The cold ethereal solution, separated by the filter (*a*), was also evaporated to dryness in a water-bath, and the weight of the residue was accurately taken.

An oily, transparent, and slightly-yellowish body remained behind, very similar in appearance to olive-oil, which, upon cooling, became converted into a semifluid mass, slightly opalescent.

(*c*) The residues from the ethereal solutions (*a*) and (*b*) were both treated with boiling alcohol, sp. gr. 0·813. They dissolved with facility, furnishing solutions, which, upon cooling, became opalescent and muddy, and by repose deposited white pearly flocculi. These occurred to the greatest extent in the solution of the body insoluble in cold ether,—in fact, they formed two-thirds of its entire weight. These flocculi having been separated by filtration, and the filters well washed with *cold* alcohol, the *solutions* were evaporated to dryness in a water-bath, when a transparent, yellowish, oily body remained behind, which, upon examination, possessed all the characters of *elaine.*

(*d*) The light flocculent substance, when separated from the filter, was acted on by an excess of a warm concentrated solution of caustic potash. The resulting soap was then repeatedly treated with warm alcohol, sp. gr. ·835, in which it almost entirely dissolved, proving *the absence of stearic acid.* The alcoholic solution was then evaporated nearly to dryness, and the residue treated with tartaric acid in excess. The solution having been filtered (to separate the bitartrate of potass, &c. formed), the excess of tartaric acid present was then removed by an excess of carbonate of lime in fine powder, and the solution again filtered, and evaporated to a syrup, when a body remained possessing a sweet and pleasant taste, and having all the characters of *glycerine.*

The precipitated bitartrate of potass, when boiled with absolute alcohol, yielded a solution containing a large proportion of *margaric acid.*

(*e*) The substances *insoluble* in boiling ether (*a*) were then repeatedly treated with boiling alcohol, which removed small quantities of chloride of sodium and a peculiar extractive matter; this substance precipitated infusion of galls, but was *not* gelatine; it closely resembled the body called osmazome in its properties, but its exact nature could not be determined, on account of the small quantity present.

(*f*) The insoluble residue from (*e*) was examined under a microscope; it appeared to consist of little more than epidermoid or pavement-epithelium cells, with a few hairs; these cells were lighter than water; they were dissolved in warm nitric acid, becoming an orange-coloured solution, which assumed a still deeper colour upon the addition of ammonia. When boiled in a solution of potass, they became gelatinous and disintegrated; when ignited, they gave a white ash (*g*).

The hairs do not differ from those previously described, a few of which had escaped separation by the process adopted.

(*g*) Upon igniting the fatty matter in an open platina capsule, it burnt off with a bright smoky flame, and left a black carbonaceous residue, which, upon continued ignition, became a white ash; this consisted chiefly of carbonate, and phosphate, of lime, with a little phosphate of iron, and a small per-centage of chloride of sodium, and carbonate, sulphate, and phosphate of soda, 0·834 per cent. A quantitative analysis gave the following results:—

Quantitative analysis (after separation of hair).

Elaine soluble in hot ether, -	4·69	84·69
Do. cold ether, -	80·00	
Margarine (margarate of glycerine), -		11·68
Extractive matter and chloride of sodium,		1·24
Epidermoid cells with hairs, - -		2·39
		100·00

The inorganic constituents consist of—

Soluble salts,—carbonate of soda,		traces.		
......	phosphate of soda,			
......	sulphate of soda,	0·209	-	0·209
......	chloride of sodium,			
Insoluble salts,—carbonate of lime,		0·243	-	0 243
......	...... magnesia,	trace.		
......	phosphate of lime (tribasic),	0 243	-	0·243
......	...... magnesia, -	trace.		
......	phosphate of iron, -	some		

Insoluble salts,—sulphate of lime,	-	minute trace	
...... silica and charcoal,	-	0·139	0·139
Per cent.	-		0·834

Art. VIII.—*On Medical Topography as Connected with the Choice of a Site for a Lunatic Asylum in a Tropical Country.* By James Macfadyen, M. D., F. L. S.

It must be gratifying to the friends of humanity to observe the interest which has of late years been displayed, and the exertions which have so generally been made, to improve the condition of the insane. This commendable expression of feeling has not been confined to the British islands. It has been exhibited in the remoter portions of the empire. *There* also a sympathy has been awakened, and a disposition shown to follow the example and emulate the exertions made in the parent state, towards alleviating the sufferings and remedying the condition of those who have been visited with this, the most calamitous and overwhelming of all maladies.

The asylum hitherto provided for lunatics in Jamaica, is not less defective or objectionable than similar institutions were, and, I fear, still are in many instances, in Great Britain. To use the language of the late Dr Bancroft, "The Institution consists of three equal and parallel buildings, each 120 feet in length and 16 feet in breadth, which are surrounded by an open gallery or piazza, 7 feet wide, and are enclosed by a high wall, within an area 300 feet square." Each building contains a series of twelve rooms, 13½ feet long, and 9 feet broad. The whole accommodation, therefore, is limited to thirty-six small rooms. The consequence is, that frequently four and even five lunatics have been confined in one room. I need scarcely say how unfavourable to recovery confinement under such circumstances must have been;—the buildings situated in a populous part of the town; the rays of a tropical sun reflected from the high brick walls; with no prospect but the clear unclouded sky overhead; the time of the lunatic spent in listless inoccupancy, with nothing to withdraw his mind from the delusions with which it is disturbed. Under scarcely more unfavourable circumstances could the afflicted have been placed, in respect to comfort and recovery. The object of such a receptacle must have been the seclusion and safe custody of the lunatic; his recovery and restoration to reason could never have been contemplated.

To remedy the evil, and in accordance with the spirit of the times, the Legislative Assembly of Jamaica voted a considerable sum (L.30,000) to erect an asylum on an improved construction. A site was fixed on. It was on the occasion of an opinion being requested in approval of that site, that the following considerations were suggested.

I need scarcely insist on the paramount importance, in establishing a lunatic asylum, of selecting a suitable site. The best planned edifice, the best appointed institution, and the most judicious system of management, may be to a certain extent unavailing, if the locality be unhealthy, and the circumstances connected with it be otherwise unsuitable. We accordingly find, in treatises on the management of the insane, that this subject receives due consideration. "An asylum," observe the Metropolitan Commissioners of Lunacy, "should be placed upon elevated ground, and should command cheerful prospects; the soil should be dry, and there should be a plentiful supply of water, and means of proper drainage. The buildings should be surrounded with land sufficient to afford out-door employment for the male, and exercise for all the patients, and to protect them from being overlooked or disturbed by strangers." It is recommended by other authorities, that a situation at a moderate distance from a town be selected, and that the scenery of the neighbourhood be of a pleasing and interesting character. Let us take, to give interest to our inquiry, the site of the future lunatic asylum; ascertain what are the requirements peculiar to the climate, and determine how far the site selected possesses the advantages described as necessary.

In commencing, I would, in the first place, state, that the plain of Liguanea extends from the sea, rising by a gradual ascent for several miles into the interior. It is at the lowest point of the plain, at the sea-shore, that a site has been selected for the future asylum. The plain is watered by no river, but there is an abundance of underground springs, supplied by the rains which fall on the neighbouring hills. In the centre of the plain, these springs are in many places upwards of 200 feet in depth. Along the sea-coast, springs of water are found near the surface, either making their appearance above ground, and rendering the soil damp and marshy, or they are to be met with by digging a few feet. Let us add that in the immediate vicinity is the large town of Kingston, and that the General Penitentiary is at a short distance.

Let us now inquire what are the advantages and disadvantages of such a site.

The first and principal advantage which a site at the sea-shore possesses is, that the materials for building are readily procurable, and that there is the advantage of a cheap and easy carriage. Land-carriage in tropical countries, especially in the West Indies, is very expensive, and adds considerably to the cost of building; whereas, near the sea-shore, the materials can be conveyed to the spot by water. A consideration, however, of this kind ought not to be entertained, in erecting a building for the express purpose of relieving suffering humanity. What is the saving of a few pounds, if thereby the duration of human life is abridged, the degree of human suffering unnecessarily augmented, and if, as I think it will prove, the disease, for the amelioration of which the building is erected, is rendered, by faultiness of site, more untractable and aggravated? Doubtless a very inadequate erection, in a cool and suitable locality, would fulfil the purposes of an asylum better than the most costly building, placed in an unhealthy situation. In the case before us, I fear the intentions of a liberal humanity will be rendered nugatory by an ill-judged parsimony.

As one of the recommendations of a site near the sea-shore, may be regarded the benefit in some diseases derived from the peculiar condition of the atmosphere in such situations. The remedial influence of the air at the sea-coast, in a number of maladies, has long been recognized, although the principles on which its salutary effects depend, cannot, even in the present day, be said to be clearly ascertained. Doubtless much of the benefit procured is dependent on the equable temperature, subject to no sudden changes, regulated by the temperature of the mass of waters over which the breezes are conveyed. Hence during the hottest period of the day, the sea-breeze at the shore blows with greater force than elsewhere; possessing, at the same time, a refreshing coolness. This remarkable coolness of the breeze at the shore is doubtless the consequence of a process resembling evaporation. The air passing over the sea reaches the land saturated with moisture; as soon as it reaches the heated land the moisture becomes rarified, and, expanding, is carried upwards. This rarification of the moist atmosphere of the sea also accounts for the force with which the breeze blows at a short distance from the shore, compared with more inland situations; there being a rush of cool air from the sea to replace that which has been rarified and carried upwards.

Cool, however, and delightful as the breeze in this situation is, it has been remarked that the sun's rays are there found to be more intense and scorching than elsewhere, and to have a more powerful effect in darkening and blistering the skin. It ought also to be borne in mind that, between the tropics, there are periods of every day during which the breeze is lulled; and also, that there are certain seasons of the year during which, for days and even weeks in succession, no sea-breeze blows. The heat at such seasons is always felt most intensely at the shore,—much more so, in proportion, than at some distance inland. I can only account for this by the circumstance, that the atmosphere, by its stillness at such times, accumulates and holds in suspension an unusual quantity of moisture in the form of vapour. In passing through this damp atmosphere, the rays of the sun must become, I presume, concentrated, and their power of producing an intense heat be thereby increased. Wherever, indeed, the atmosphere is calm, and loaded with moisture, as in the vicinity of lagoons or marshy lands, the same intense and scorching heat, on exposure to the sun's rays, is perceptible.

But the sea air has other peculiarities dependent on accidental admixtures. Notwithstanding the opinion of Berzelius to the contrary, sea air does hold in suspension certain proportions of sea salt and chlorine capable of being conveyed a certain distance. Certain proportions of these are received into the lungs during respiration, and are readily absorbed and enter into combination with the blood. That saline particles are suspended in the atmosphere, is proved by the circumstance that the presence of salt can be detected on the surface of plants and other objects at a certain distance from the sea-shore. Hence, also, pastures in the immediate vicinity of the sea are, especially in this part of the world, noted for their fattening property. Now experiments have shown that, although chlorinated substances, when employed medicinally in respiration, are at first irritating to the air-passages, they are speedily found to exert a powerful antiphlogistic influence in chronic affections of the chest, even when they are of an inflammatory character.* Hence sea-air has been found most favourable in those diseases, such as phthisis, where the indication is to diminish the tendency to the intensity of inflammatory attacks, alleviating diseased action, and prolonging the life of the sufferer.

I may add that it is an advantage possessed by sea-air, that it is purer and freer than that of the land from carbonic acid and mephitic exhalations. It is therefore better adapted for respiration. In ordinary health, the benefit derived from it may not be appreciable. It is different, however, when the lungs are in a great measure unserviceable and impermeable from disease, and where but a small portion remains sound to fulfil their essential function.

I would now proceed to remark that a residence at the sea-shore must be unhealthy, from the high degree of atmospheric pressure. The influence of this condition of the atmosphere on the health has been well ascertained. It has indeed been admitted to a certain extent ever since the discovery of Torricelli. It is an old observation, that apoplexy is more common and more fatal when the barometer is high, and that derangements of the health appear to be consequent on frequent fluctuations in the mercurial column. Dr Caspar (British and Foreign Medical Review, No. 47), has deduced from numerous observations the axiom that a high atmospheric pressure increases, and a low pressure diminishes, the rate of mortality. Tables kept carefully for a number of years at Berlin, Paris, and Dresden, registering the variations of the barometer and the numbers of deaths, all agree in the fact that the deaths are more numerous when the barometer is above the mean (29·83 inches), than when it is below it, the proportion being as 101·5 to 100. This difference may be regarded as trivial. It will not be so considered when you bear in mind that a certain number of additional lives will be sacrificed, should you make choice, for a building calculated to contain nearly 300 inmates, of a situation nearly on a level with the sea, in preference to one more elevated and otherwise more eligible. You are to recollect that the building you are about to erect, is intended for the permanent habitation of a numerous succession of human beings, and that there are no circumstances bearing on the health or the duration of life that ought, in commencing such an undertaking, to be overlooked.

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* Guastalla, Annales de Therapeutique, Nov. 1843.

There is another objection to low-lying situations near the seashore, and that is the high temperature which there prevails. It amounts almost to an axiom in medical statistics, that extremes of temperature, whether high or low, are eminently destructive to life. This is confirmed by the tables of mortality issued weekly by the Registrar-General. When the summer heat is more than usually intense, there is found to be a corresponding increase of disease and death. In like manner, according to the Berlin tables, the mortality of a severe, compared to that of a mild winter, is as 17·3 per cent. to 15·1. At Paris, in twelve summer months, with a temperature under 66°, the deaths were 21·895; while in twelve summer months, with the temperature above 66°, the deaths were 22·471 (British and Foreign Medical Review, No. 47, p. 97).

But there is a further objection, peculiarly applicable in the present case, in selecting the site for a lunatic asylum, and that is, that high temperatures are favourable to the development of diseases of the nervous system. Insanity is more the product of irritability than of inflammation, and hot climates are obviously unfavourable to the removal of that state of the system. We find, indeed, that diseases dependent on nervous debility for their origin, are more frequent in warm than in cold climates. In northern countries, such as Scotland, the excessive and long-continued use of ardent spirits commonly declares its pernicious effects by inducing schirrhous hardness of the liver. In Jamaica, that disease is rare, and it is the nervous system that suffers, *delirium tremens* being the usual catastrophe. In England, scrophulous meningitis is a common disease of childhood. In Jamaica it is rarely observed; whereas we have in its place, as one of our most common and fatal infantile complaints, inflammation of the membranes of the brain, running its course in one or two days. This latter disease is evidently connected with very high atmospheric temperature. It is exceedingly prevalent in the arid and hot plains of St Catherine's, known as the Salt-pond District, proving fatal even to the children of black parents. On the contrary, it is rarely met with among the families residing in the more elevated districts.

Lempriere* observes, that, "during the months of July, August, and September, the nights are uncommonly sultry and oppressive from the failure of the land-wind." The skin becomes dry and parched, requiring repeated spongings with cold water to moderate the scorching heat. There is also throbbing of the temples, accompanied with an excited state of the nervous system, productive of restlessness, and banishing repose; and it is not till the cool land-wind comes down, on the approach of morning, that sleep establishes its balmy influence over the exhausted frame. On awakening in the morning, after such a night, there is langour and pains of the limbs, and a feeling of exhaustion and weariness beyond what is usually felt after a mere sleepless night. At this season of the year, how delightful to escape to the mountains! The nights there, even in the hottest months, are cool and refreshing, bringing with them, to the exhausted visitor from the plains, the long-absent blessing of sound and refreshing slumber.

But it is not necessary, in search of cool nights, to go far into the interior. These may always be found within a few miles' distance from the sea-shore,—for instance, within a short distance from Kingston, at the more elevated situations of the plain of Liguanea. It is remarkable how very few degrees of the thermometer separates the agreeably warm from the oppressively hot. The thermometer at 85°, the heat is tolerable; but when it ascends to 90°, it becomes almost insupportable.

When you recollect that sleeplessness is one of the most constant symptoms of mania, and that to remove this state is one of the most indispensable indications of the treatment, the principle of placing an asylum in a cool locality is obviously a consideration of the first importance. One of the earliest and most certain proofs that the mind is about to recover its calmness, is when a refreshing and sound sleep brings oblivion to interrupt the wild and irregular course of the ideas. On the contrary, in an asylum situated on a low position, near the sea-shore, where the temperature is always high, we have every reason to expect, that during the oppressive and sultry night of midsummer, all amendment must not only be checked, but that the sleeplessness and consequent nervous irritability, the character of the disease, will be aggravated. Beyond dispute, it is a great error, in erecting a lunatic asylum in a tropical climate, to place it in a low hot situation, and not to secure, what can readily be obtained—a cool temperature during the night season. Unquestionably, this error has been committed in fixing the site of the intended Jamaica asylum; for the district selected is one of the hottest in the island.

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* Practical Observations on the Diseases of the Army in Jamaica. By William Lempriere, Apothecary to His Majesty's Forces. 2 vols. 8vo. London, 1799.

We now come to a consideration the most important in making choice of a locality for an hospital or asylum in a tropical climate, —the ascertaining whether the circumstances of the locality are favourable or otherwise to the production of malaria. It is now well understood that the immediate vicinity of a morass is not the only or most common condition necessary to render a locality malarious. In the place of our contemplated lunatic asylum, there is an extensive lagoon about four or five miles to windward. I do not consider it possible that malaria can be conveyed such a distance. In the first place, it would be diluted and dissipated by the strong sea-breeze; and, in the second place, the intense heat of the land along the shore, over which it must pass, would rarify, and cause to ascend the vapour or moisture, the vehicle in which it is suspended.

But we have the best authority for asserting, that malaria in the most intense degree may be produced when the surface of the soil is dry, and shows no sign of moisture. Dr William Fergusson, in his paper on the Nature and History of Marsh Poison, published in 1821, remarks, that remittent fevers of the most malignant and fatal character uniformly prevailed, during the campaigns of the Peninsula, whenever the army was obliged to occupy the arid encampments of the level country. This was particularly remarkable on the retreat through the plains of Estremadura, after the battle of Talavera. The march of the troops lay through a dry and arid country, with the Guadiana and the smaller streams, from the want of rain, dried up, with no vestige of water, except a few detached pools. At this time the army suffered so much from fever, evidently of malarious origin, that it was generally believed by friends as well as enemies, that the British host had been extirpated. This is corroborated by the testimony of Dr Joseph Brown, in the article *Malaria*, in the Cyclopædia of Practical Medicine. He informs us, that he can state from personal observation, that cases of fever and ague abounded in parts of Estremadura at a distance from any stream, where no influence from visible water or dampness could be supposed to favour their production.

As water equally with heat, together with the remains of organic bodies, is necessary for the production of malaria, it may be asked, where are the indications of its presence in cases such as those alluded to? It will be found that the dryness is only superficial. According to Dr Fergusson, the only condition indispensable to the production of marsh poison on all surfaces capable of absorption, is the paucity of water where it had previously recently abounded, —a rule without exception in climates of high temperature.

In the case of the site of the proposed lunatic asylum, we are aware, as has been already stated, that there is an abundance of water near the surface, from the soil being richly supplied by springs. The surface itself may be baked and dry as a brick-ground, and vegetation may be utterly burnt up. But the subsoil is full of moisture, combining with the organic remains which it contains, developing, under the powerful influence of a tropical sun, those noxious emanations productive of one or more of those diseases claiming a malarious origin.

It is different with the central district of the plain of Liguanea. The springs are at a great depth,—not less than 200 feet below water the surface. The soil is dry and gravelly, and there is, in ordinary seasons, a perfect immunity from diseases of a malarious origin. It is different after the vernal or autumnal rains. As soon as the soil, saturated with moisture, begins to dry, diseases of a malarious origin begin to show themselves, and intermittent fever and dysentery very generally prevail.

My opinion is, that the site selected for the new asylum is decidedly malarious. The poison during the day, when the sea breezes prevail, may be innocuous. But it is different in the evening, or during the period of the year when the customary winds cease to blow or are irregular. At such times the atmosphere is loaded with moisture, affording a suitable vehicle to hold suspended the noxious exhalations till they are gradually condensed. Be it remembered, that this locality has ever been regarded as one of the most unhealthy in the vicinity of Kingston. We are told of families at one time resident there, all of whom, mother and children, have been swept away, all of them dead, the father alone escaping, from the greater portion of his time being spent in the town, at a distance from the seat of the malaria. Bereavement and sickness have ever been considered the doom of a family venturing on the occupancy of the locality.

It may be suggested that much has been done by draining and other agricultural processes in rescuing from the domain of malaria districts once noted as unhealthy. But there are districts, such as the Pontine marshes and the Maremma of Tuscany, all of them, like the site of this asylum, situated near the sea-shore, which have proved incorrigible, and to improve which all the art of man has been exerted in vain. I do not assert that the situation under consideration is at all to be compared with those specified in point of insalubrity. I am confident, however, that like them the site will always prove to a certain extent unhealthy.

I now proceed to examine the opinion entertained by some even of the medical profession, that if a locality is not remarkably infested by febrile diseases of a remittent or intermittent character, it must therefore be pronounced free from the influence of malaria. This opinion on examination will be found perfectly erroneous. As remarked by Dr Baly in the third of his Gulstonian lectures, some unappreciable condition of the atmosphere determines "whether the malaria shall produce a mild diarrhœa, a severe dysentery, cholera, or fevers of different kinds." In certain spots ague is endemic; in others, where ague is never seen, other endemic diseases are rife. There must, therefore, be distinct varieties of atmospheric poison, or certain modifications, depending perhaps on greater or less intensity, acting determinately, though in different modes, on the constitutions of those exposed to its influence.

It is malaria, according to Dr Baly, which has rendered the Millbank Penitentiary so unhealthy. Diarrhœa has seldom, since the institution commenced, been altogether absent; and dysentery has been a frequent disease, prevailing in one particular year as a severe and fatal epidemic. The prevalence of these diseases cannot be attributed to defective ventilation, poorness of diet, or any other assignable cause. The sickness was also found to prevail most at those seasons, and in those states of the atmosphere, which most favour the decomposition of organic matter in the soil. Dr Baly concludes, that to malaria is the prevalence of the disease attributable.

Dr Budd, in the Medical Gazette for 1841–42 (No. 51, p. 939), in noticing the epidemic which prevailed at the Millbank Penitentiary in 1823 (to inquire into which Dr Latham and Dr Roget were appointed by government), expresses his doubts as to its malarious origin, and speaks with confidence as to its being propagated by contagion. Doubtless dysentery is a disease capable of becoming eminently contagious, when a number of human beings are crowded in a limited space. The fever, which is always present in severe cases; the frequency of the evacuations; their putrid and offensive character; and the circumstance, that in prisons, at least with us, there is but a limited number of conveniences, generally in common use by the diseased and the healthy,—all must combine to cause the development in a concentrated form of that element in the exhalations of the human body, capable of calling forth that diseased action in the human system with which it is connected. I am favourable to the opinion, that dysentery, under certain circumstances, is contagious. But this does not account for the origin of the disease. To me, the facts and reasoning of Dr Baly on this subject are conclusive. They are quite in accordance with my own observations and experience.

The Kingston General Penitentiary appears to me to afford an analogous proof of this doctrine. The number of the prisoners is seldom under 600. Here also bowel complaints are of frequent occurrence, and dysentery is remarkably fatal. To me, the only assignable cause appears to be malaria. There are free ventilation, good food, and an abundant supply of water for the purposes of cleanliness. The source of the malaria must be the abundance of springs that are situated immediately below the surface. The site itself was a reclaimed morass. The surface is hard and baked like a brick. But the heat, combined with the under-ground moisture, acts on the organic principles contained in the soil, so as to generate the subtle and malignant principle of malaria.

It is remarkable that, both in the case of the Millbank and of the Kingston Penitentiaries, in order to disprove the presence and influence of malaria, it has been alleged that the immediate vicinity is not considered more than usually unhealthy. Dr Baly has answered this objection by stating, that the health of free persons not confined to the locality, who spend a great proportion of their time abroad,—their bodies kept in health by active and voluntary exercise, and by cheerful and varied trains of thought, and not denied the opportunity of gratifying their palate or appetite with any articles of diet and drink within their means,—is not to be considered as a test of the salubrity of a locality. Such may have their homes in a malarious locality, and have an immunity from the effects of the morbific agency prevailing there; while the reverse may be the case with those who are imprisoned on the spot, never removing from the place, and constantly exposed to the influences of the locality.

As the site of the asylum is in the immediate vicinity of that of the penitentiary, and as it is of a similar character, we have good cause to fear that there also the effects of malaria will be manifest, if not in the development of febrile diseases, in the not less to be dreaded or less fatal prevalence of diarrhœa and dysentery.

In conclusion, let me note some additional disadvantages which would lead us to form an unfavourable opinion of the site. The first disadvantage of the site is the immediate vicinity of a large town. The asylum, when completed, will form a portion of the suburbs of Kingston. The neighbourhood of a numerous idle and profligate population, such as that of Kingston, must compel the institution to be enclosed, in order to exclude frequent and mischievous trespassers. High walls and strong gates must be erected, giving to the premises the appearance of a prison. This ought always to be avoided, as it tends to produce the impression of the place being one for punishment and restraint,—an impression which it is desirable should not be entertained. This impression will, doubtless, be strengthened, and have a more depressing effect, from the circumstance that the asylum is contiguous to the penitentiary. The associations which such a neighbourhood is calculated to call up, must have a very injurious effect. The insane even in his worst paroxysm has a consciousness of the calamity which has befallen him, and is acutely sensitive to the scorn and contumely directed against him by the thoughtless and unfeeling. The site of a vast prison, encountered in the progress to the asylum, and the walls and gates which, on reaching his destination, shut him out from intercouse with the world, must have a mischievous influence on his malady, and aggravate the mental sufferings.

We have already enumerated, as one of the desirable qualifications of the site for a lunatic asylum, that it be rather elevated, so as to command a cheerful prospect. In the site chosen for the Jamaica asylum, this consideration has been neglected. Its elevation is not many feet above the level of the sea, while there is a gradual ascent towards the interior; so that there is no view in that direction, with the exception of the distant summits of the mountains. As for the prospect of the sea, it has been well remarked,* that "a wide unbounded view, though striking at first, is apt to pall and weary the minds of those who, day after day, year after year, look out only on this one monotonous landscape."

In the treatment of the insane, it is of the greatest importance to operate on the mind by means of the external senses; and of all the senses, that of sight is found the most available in transmitting a variety of impressions to the brain. This aid we deny ourselves, when we select a site with a limited prospect, or one that is tame and uninteresting. No pleasing objects meet the eye. The mansion of the wealthy proprietor, with the scattered dwellings of industry and labour; the changes the face of the country undergoes during the progress of the year, or of cultivation,—all of them calculated to attract the attention and to interest the mind; and in place of the wild imaginings and the hallucinations which disturb their peace, to awaken the impressions of former and happier days, and to afford the materials for calm reflection.†

Such are the observations I have been induced to offer connected with this interesting and not unimportant subject. It is a subject on which medical information is still very deficient, and on which we are as yet without any established principles to guide us in our opinions. The notions commonly entertained as to the nature and origin of malaria, are vague and undefined, serving rather to embarrass than assist us in our inquiries. It hence happens that a non-professional person, if possessed of shrewdness and observation, is more likely, by attending to the dictates of common sense, to arrive at a correct opinion on this subject, than the medical man with his imperfect information and ill-defined principles.

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* North British Review, No. vi. p. 390.

† The question may be asked, is it not probable that the constant proximity to the sea may awaken a propensity to suicide by drowning?

It is to be hoped that the preceding observations may be of some service to those who, in other tropical countries, may have the task allotted them of planting a site for a lunatic asylum. We have good grounds for the apprehension that the Jamaica Lunatic Asylum is destined to afford an illustration of the evils and disadvantages of an ill-selected site. It may be some time ere this be generally allowed. Many unfortunate beings will have had their days shortened; many cases which promised well for recovery will remain unrelieved, or fall back into hopeless idiocy, ere the unsuitableness of the site be generally allowed. The few who now dissent from its condemnation, will in time become converts to the opinion which common sense and common observation dictated from the first.

Kingston, Jamaica,
8th May 1848.

ART. IX.—*History of a Case in which a Foreign Body, Lodged in the Œsophagus for nearly Five Months, proved Fatal by producing an Ulcerated Passage into the Trachea.* By ROBERT PATERSON, M.D., F.R.C.P.E., one of the Physicians to the Royal Infirmary, and to the Leith Dispensary, Humane Society, and Casualty Hospital, &c.

FOREIGN bodies which enter the pharynx accidentally, or are intentionally introduced for suicidal purposes, are of very various sizes, nature, and characters, as regards their external surface and figure. The anatomy of the pharynx and gullet proves that no body from its size alone is likely to be impeded in the course of the œsophagus, if it only pass the inferior constrictor of the pharynx; the muscular contractions of the œsophagus being sufficient for pressing that body downwards into the stomach. But the shape of bodies thus introduced into the pharynx, and the circumstance of their being bounded or not by sharp edges and angles, often exercise remarkable influence on their transition along the tube, or the position they may occupy; and if the edges and angles of those bodies are such that they interrupt its progress along the tube, very serious consequences may result from the body or bodies being thus impacted in the walls of the pharynx. We have on record some most remarkable cases of bodies of large size passing into the stomach. A number of clasped-knives, some of them of large size, were in one instance swallowed at different times, and conveyed into the stomach; buckles, rings, coins of various sizes, small padlocks, and even a gold watch and seals, have either been accidentally or intentionally swallowed; and my friend, Dr Jackson of London,* has recorded the history of a case, in which a female pressed the ring of a large key a certain length down the œsophagus for the purpose of committing suicide, and which had caused death by inducing inflammation of the œsophagus, the larynx, and trachea.

In all these instances the bodies possessed blunt or rounded edges and angles. When these angles are sharp, the body is detained in some part of the pharynx or œsophagus, causing laceration and ulceration of parts, and producing the most formidable change, by effecting false openings and new communications between contiguous organs. Dr James Duncan describes, in the first number of the Northern Journal of Medicine,† a remarkable instance, in which a thin gold plate, with sharp extremities, and to which were attached two artificial teeth, had been allowed to slip into the œsophagus, where it became fixed by the sharp angles of the metal, caused ulceration of the œsophageal textures, and gradually worked its way to the arch of the aorta, in which it had effected a perforation of the size of a large crow quill, about half an inch below the origin of the left subclavian artery. This perforation was the cause of the death of the patient by hemorrhage.

There would seem to be great varieties in the size of the inferior pharyngeal opening in different individuals. Some persons can swallow bodies of considerable size; while in others, a comparatively small body is arrested, and often requires to be removed by manual extraction. Thus, in adults, shilling and farthing pieces, buttons, &c. have been known to require to be extracted in this manner.

Those bodies, however, which have a rough-pointed or angular surface are by much the more dangerous from accidents of this kind. They are liable to be arrested in the folds of the pharynx, and, if they are not caught there, they are often detained in passing the inferior constrictor, or at some portion of the œsophagus. This arises, obviously, from the unequal surface, which does not slide over the mucous membrane like a smooth body, but is caught by it, and, producing irritation, leads to further muscular contraction upon, and consequent fixing of the foreign substance. Of this class we have references to various published cases, where fish-bones, an ear of rye, a portion of a quill, and other substances of a like nature, became fixed in the œsophagus, and gave rise to serious symptoms.

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* Edinburgh Medical and Surgical Journal, Vol. lx. p. 195. Edinburgh, 1843.
† May 1844, p. 16.

The melancholy case which I am about to describe belongs to this latter class.

M—— R——, a stout, healthy, intelligent, and lively girl, of from 5 to 6 years of age, was amusing herself with some companions in the beginning of November 1847, with a set of German toys. They had been manufactured into a tea-set, composed of plates, cups, saucers, &c., the edges of which were roundly indented or scolloped, and the body of them hollowed out like shallow basins. While putting one of them into her mouth, one of her companions struck her under the chin, which caused her to swallow the toy. Being frightened at what had occurred, she immediately ran and informed her parents, and a neighbouring apothecary was immediately sent for. She had vomited, however, before he reached the patient's abode. He examined the pharynx, and throat, and, finding nothing there, administered an emetic, which speedily acted well. She afterwards swallowed some tea and bread, and ate it apparently with relish, swallowing it without the slightest difficulty. The same evening, about bed-time, she expressed to her mother the belief, that she had just swallowed the toy, for that she felt it distinctly pass downwards. After passing a rather restless night, she awoke next morning slightly feverish, and continued so for a few days. She never, however, complained of pain in the throat or the least difficulty in swallowing. The only complaint was a trifling degree of epigastric tenderness, which was attributed to the irritation produced in the stomach by the presence of the foreign body, which was supposed to contain, in addition to its amalgam of zinc, a small quantity of arsenic.

For four months after the occurrence above-related, the child continued apparently quite well. She was lively, went to school, took her food as usual, and no change whatever was observed by her parents or friends upon her appearance, appetite, health, or habits. The foreign body, however, was not ascertained to have been passed by stool, although frequent purgatives had been administered for the purpose, and the egesta had been carefully and anxiously examined.

On the 22d of February, nearly four months after the swallowing of the toy which we have described, this child was suddenly seized with an attack of croup. She had been exposed to the damp air of the preceding night, to which her mother attributed the croupy attack. The symptoms were characteristic, and there was considerable accompanying fever. Leeches were applied to the throat. She had an emetic and the warm-bath; subsequently a blister was applied, and the prominent symptoms of croup disappeared. It was not till the second day after this attack that I was informed that she had been noticed to cough and eject whatever she attempted to swallow. This I at first attributed to the inflammation of the throat or of the upper part of the larynx succeeding the attack of croup. Next day, however, I had an opportunity of witnessing her attempt to swallow both liquids and solids. These were taken with avidity, but whenever they reached a certain point, violent coughing and ejection of the morsel or mouthful of fluid immediately took place. Although the symptoms of croup had now entirely subsided, and the breathing was quite soft and free, and unaccompanied with any roughness, still the pulse kept frequent and the skin hot. The throat was carefully examined both internally and externally, and nothing could be seen or felt to account for the peculiar symptoms.

My friend Dr Coldstream now saw her along with me, and after careful and patient investigation of the anomalous symptoms presented, we came to the conclusion, that the peculiarly harassing symptoms of this case must either arise from an œdematous state of the *rima glottidis*, from ulceration of the œsophagus itself, or from the foreign body still being present somewhere about the lower part of the pharynx or œsophagus. With the view of assisting our diagnosis as much as possible, we determined to pass the finger down the pharynx as far as possible, and if that did not yield any satisfactory result, to pass down a flexible tube into the stomach with the view of ascertaining if any constriction of the œsophagus existed, or if any foreign body still was lodging in it.

Dr C. and myself having both carefully examined with the finger the state of the pharynx and upper part of œsophagus, as well as the opening of the glottis, without being able to discover anything abnormal, a tube was then passed down into the œsophagus, which entered easily and proceeded rapidly at first, but was soon arrested by something, and on pressing it still slightly onward, air began to pass through the hollow tube. The same result followed all the attempts made both by Dr C. and myself.

The diagnosis of this case now became a little more distinct. That an opening existed between the œsophagus and trachea was most probable; but whether this was the result of simple ulceration, or arose from the pressure of the foreign body, it was impossible to determine. The only course of treatment, however, which was left to us, was that of allaying irritation and supporting the rapidly-failing strength of our little patient. With this view, nutritious enemata, with small quantities of morphia, were repeatedly administered,—not a morsel of food nor a drop of fluid being apparently swallowed. She continued to be nourished pretty well at first. But soon the strength began to fail. Emaciation was rapidly increasing.

She became feeble, totally exhausted, and died calmly on the 20th day of March 1848, being twenty-six days from the occurrence of the sudden attack of croup, and nearly five months after the date at which the foreign body was accidentally swallowed.

The *post-mortem* examination revealed the true state of matters. The foreign body was found fixed in an opening between the œsophagus and trachea, about five inches down. The œsophagus was opened from behind. The *rima glottidis* and upper part of the trachea were quite healthy; but a short way down the œsophageal tube was seen the foreign body, and about a third part of it was inserted into an ulcerated fissure which communicated with the trachea. The fissure was about one inch and a-half in length, with an inflamed margin; the mucous membrane around the foreign body was all more or less inflamed; the calibre of the tube beneath was much smaller than that above the foreign body. The tin saucer lay with its cup-like cavity upwards, completely filling the calibre of the œsophagus, and so placed, that, upon fluid being poured into its cavity, it at once trickled through the ulcerated opening into the trachea. The interior of the toy was encrusted, especially at the most depending part, with a white cretaceous-looking deposit, very similar in appearance to the urinary phosphatic deposit.

The *post-mortem* examination therefore explained, in the simplest and clearest manner, the symptoms presented by this somewhat singular case.

The foreign body, when first swallowed, had obviously never passed beyond the point at which it was found.

Its rough edges had been the means of arresting its progress downwards.

At first it must have been lodged in a somewhat upright position, to enable the boluses of food and the liquids drank to pass readily over its smooth convex or lower surface.

The ulceration had no doubt been proceeding slowly for some time; but on its suddenly causing perforation of the trachea, the attack of croup commenced.

On the occurrence of the perforation into the trachea, it is most probable that a certain change took place in the position of the foreign body. Its lower edge had slid forward into the ulcerated opening, and the body of it had fallen backwards, thus filling completely the calibre of the œsophagus, and presenting its cup-like cavity upwards, or rather in a slanting direction.

It may be remarked, in conclusion, that two circumstances, both clearly pointed out, might have been had recourse to, with the prospect of relieving the patient and prolonging her life.

First, A pair of œsophagus forceps might have been introduced, and the foreign body caught hold of and extracted.

Secondly, It was a good case for the operation of œsophagotomy, had the former not been practicable.

In addition to both of these circumstances, I would remark, that the swallowing and progress of the foreign body was veiled in much obscurity. There was probable reason to believe, that it had been perfectly swallowed, and, although not passed by stool, it might have been lodging in the stomach or some other part of the intestinal canal. The child was perfectly well, playful, and happy, eating and drinking with appetite, until the sudden occurrence of the croup, and which, too, came on, let it be remembered, after exposure to cold and damp. Further, even after the flexible tube was passed into the œsophagus, it could not be determined that it came against a foreign body, but only seemed to be slightly arrested, and the air then passed through it. This was accounted for by the cup-like cavity of the foreign body having been found filled with the remnants of the food attempted to be swallowed. There was no pain externally, or swelling in any part of the neck. The foreign body, in fact, lay immediately behind the upper part of the sternum.

ART. X.—*Summary of Cases in which Unnatural Communications had taken place between the Œsophagus and Trachea or Air-Passages, chiefly in consequence of the Progress of Disease.*

EXAMPLES of preternatural communication between the œsophagus and windpipe, or some of the adjoining organs, though not uncommon as the effects of disease, are as the effects of the presence of foreign bodies in the œsophagus rather rare. Of this sort of communication between the œsophagus and the windpipe, *bronchi*, *pleura*, or lungs, M. Vigla published, in 1846, twenty-three examples, collected from various sources. But the great majority of these communications were the consequence of disease of the œsophagus, often of a cancerous nature, and in which the ulcerative process had formed for itself an opening or fistula into the interior of the windpipe, the *bronchi*, the lungs, or the pleural cavity.*

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* Recherches sur les Communications Accidentelles de l'Œsophage avec les Poumons et les Bronches. Par le Dr Vigla, Medecine du Bureau Central des Hopitaux. Archives Generales, 4e series I. XII. Octobre 1846.

M. Vigla arranges the cases collected by him into five orders or categories.

1. The œsophagus perforated communicating with one or both lungs. Ten cases.
2. The œsophagus perforated communicating with one of the pleuræ. Two cases.
3. The œsophagus perforated communicating with the right bronchus. Three cases.
4. The œsophagus perforated, or diseased, contiguous to a lesion of the lung or pleura, and in a state of imminently approaching communication. Four cases.
5. A foreign body introduced into the œsophagus, paves for itself a passage outward by forming a fistulous opening through the chest. Four cases.

Of these cases it is unnecessary to give details. The authorities and general characters only are mentioned.

I.—*Cases in which the Perforated Œsophagus communicates with one or both Lungs.*

1. Boneti Sepulchretum. Lib. iii. Sectio viii. Obs. 64. Left lung destroyed in a man who had suffered long from pains in the back; the lobe adhered firmly to the spine; the œsophagus ruptured, and black fluid had escaped into the stomach.

2. In a man of 50, dysphagia, with entrance of alimentary articles into the air-passages. In the upper and back part of the right lobe of the lungs, a large ulcerated cavity, penetrating and almost destroying the substance of the œsophagus, from the first to the third or fourth vertebra of the back. Ulceration of the œsophagus communicating with the *trachea* by an irregular opening more than half an inch long, traversing the substance of the windpipe. Much purulent matter within the trachea; a little in the œsophagus above and below the aperture; a good deal in the stomach. (Medical Communications, Vol. i. Art. 11, p. 157. London, 1784. By William Keir, M. D., Physician to St Thomas' Hospital.)

3. In a woman of 38, mother of six children, in the middle of the right lung a large quantity of gruel-like purulent matter; an opening penetrating thence into the œsophagus, the interior of which was then found to communicate freely with the purulent collection; the edges of the aperture hard, irregular, and as if gangrenous. Below this spot the texture of the œsophagus hard with contraction of its interior. Between the cardia and pylorus, in the small arch of the stomach, a hard skirrhous tumour. This was probably the effect of skirrhous induration of the œsophagus. (J. Bleuland, *Obs. Anat. Med. de sana et morbosa Œsophagi Structura.* Lugd. Bat. 1785. 8vo. P. 94.)

4. In a lady of 59, who had felt from infancy narrowness of the pharynx and difficulty in swallowing; the œsophagus, im-

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8 In a man of 53, who for years had suffered from dyspeptic symptoms and vomiting, and who eventually had dysphagia and was much wasted; the walls of the œsophagus, unchanged above, presented opposite the sixth dorsal vertebra a skirrhous ulcer about three lines thick. At the lower margin of the skirrhous induration, the calibre of the œsophagus was so much narrowed, that it could scarcely admit a writing-quill. The right lung adhered intimately to this tumour, which in its centre presented an opening corresponding to a large ulceration of the substance of the lung. This ulcer formed a cavity, which, though partly-filled with air, contained about six ounces of whitish-grey fluid, gruel-like, and some of which was seen in the windpipe. It exhaled an odour analogous to that from gangrenous parts, and its walls, which were covered with a yellowish-grey coating, were very irregular, and formed from the substance of the lung. Below the opening of communication of the œsophagus with the pulmonary ulceration, the calibre of the œsophagus was very much narrowed, so that articles of food and drink passed more easily into the cavity formed by the ulceration of the lungs than followed the course of the œsophagus. (Bibliotheque Medicale, T. xxxiv. p. 85, 1811. Mr Moutard Martin.)

9. M. Portamier, mayor of the town of Frejus, aged 64, formerly captain of a merchant vessel, affected, in December 1831, with painful dysphagia, which at length increased to such a degree, threatening suffocation, with difficult breathing, that he died exhausted and worn on the 11th of the ensuing September 1832. The right lung was softened, and easily reducible into a blackish-green fetid pulp; and at the concave margin, where enter the *bronchi* and vessels, was a large cavity which appeared to communicate with the interior of the œsophagus, which was united to the lung by extensive adhesions. Below the upper half of the œsophagus, for the space of two inches and a-half, was a contraction or stricture, closing almost completely the calibre of the œsophagus. The walls of this last tube presented many ulcerations, different in size and depth, covered with pale, very friable vegetations. These ulcerations were mostly the origin of an equal number of little sinuses communicating with each other, and which almost all terminated in a sac about half an inch square, formed in the posterior wall of the œsophagus, and protected before by a true tricuspid valve formed from some bundles of the softened muscular fibres. This cavity continued to the right, and opened into the pulmonary cloaca already mentioned.

This case appears to furnish an example of skirrhus of the œsophagus, causing secondary ulceration and softening of the lung. (Bulletins de la Societe Anatomique, 1833. Bullet. No. 48, et Revue Medicale, Aout 1833. M. Grisolle.)

10. A girl, 12 years of age, in the Paris Hospital for Children, in September 1840, was attacked with scarlet fever, which terminated fatally at the end of five or six days. The breath was fetid, with pain in the right side of the chest, purulent fetid expectoration, and emaciation. The œsophagus presented on the median line, in its anterior wall, four perforations; one superior and transverse between two and three millimetres in size, the other three like small vertical fissures. These four openings terminated in an irregular excavation anterior to the œsophagus, capable of holding a small apple, and which, with several offshoots, ended in a cavern formed at the lower and posterior part of the right lung. The latter cavity was as large as a small rennet, and both were filled with gruel-like semifluid matter, with a gangrenous smell, and shreds and debris of the pulmonary tissue. This pulmonary cavity communicated with another irregular space capable of holding a plum-stone; and in both large bronchial tubes terminated. The second cavity communicated with a third capable of holding a nut at the base of the right lung. The upper and middle lobes of the right lung were infiltrated with grey tubercular matter and granulations. (Archives Generales, 4 serie, T. ii. p. 386. Ernest Boudet sur la Gangrene Pulmonaire.)

11. In a man of 48, dysphagia, and frequent introduction of drinks into the air-passages; symptoms of pulmonary and laryngeal consumption; death by exhaustion and hectic, at the close of fifteen months. The beginning of the œsophagus narrowed for the space of six centimetres; its calibre reduced to that of a female catheter; walls hardened and thickened about one centimetre; the inner surface of the canal covered with fungous vegetations of a yellowish colour. Amidst these fungous vegetations, three centimetres from the cricoid cartilage, on the right lateral part of the œsophagus, a little anterior, were two apertures nearly equal in size, rounded, with smooth circumference, capable of admitting a female catheter, and separated by a membranous fold. These two apertures led to one common canal, very large at its origin, then contracted like a funnel, and penetrating, after a short passage through the adherent pleuræ, into a cavity at the apex of the right lung. The walls of the fistulous passage forming the communication between the lung and the œsophagus consisted of a tissue similar to that of the indurated portion of the œsophagus, and closely resembling skirrhous structure. (Recherches sur les Communications Accidentelles de l'Œsophage avec les Poumons et les Bronches. Par le Dr Vigla. Archives Generales, 4 serie, T. xii. Octobre 1846. P. 136.)

To the cases now enumerated may be added one given by Gustavus Kunze, of Leipsic, author of a learned and useful dissertation on *Dysphagia*, published at Leipsic in 1820.

12. A man aged 60, of strumous constitution, began to suffer from various painful and uneasy sensations in the chest and throat, with difficult deglutition and a sense of obstruction to articles swallowed, beneath the sternum, in the region of the fifth or sixth rib. He was received into the hospital on the 20th October 1818, when he had been ill for some months. Wasting and debility speedily followed. Some time after admission, a probang was introduced, and it was ascertained that some obstruction, not very firm, did exist at the posterior wall of the œsophagus corresponding to the fifth dorsal vertebra. The obstruction, nevertheless, yielded to the instrument, and allowed it to pass into the stomach. The examiner appears to have inferred that the impediment was external to the œsophagus. The introduction gave little inconvenience; and the patient rather solicited and wished for its repetition. The difficulty of deglutition continued and increased, so that all articles of food were brought back, and could not enter the stomach.

On the 4th December, apparently he brought up unexpectedly, after an effort to vomit, considerable quantities of purulent matter, which was believed to have come from an abscess in the posterior mediastinum. Articles of food were after this more easily swallowed. But violent fever came on; the patient wasted apace; and reduced to the most perfect weakness, he breathed his last on the seventeenth day after the discharge of matter from the œsophagus.

From the sixth to the eighth dorsal *vertebræ*, the left lung, with the tracheo-bronchial glands enlarged in size, was found united, with the œsophagus descending behind it, and with the aorta. Upon separating these, a vomica was laid open, entering deep into the parenchyma of the lung, and effusing fetid purulent matter. The residue of the lung was sound. At that spot, where the œsophagus passed the mass of indurated glands and the vomica, it appeared manifestly dilated, with swelling and corrosion of its tunics; and for the length of one inch, they were indeed destroyed by irregular ulceration. By this disease, a communication had been established between the vomica and the interior of the œsophagus. The folds of the inner or mucous coat of the œsophagus were covered with tenacious mucus, changed in various parts into the hard consistence of callus. Below that point the contraction of the canal was greatest, being produced by a cartilaginous-callous layer. The walls of the vomica were also indurated.

A lateral twist of the vertebræ, with slight antero-posterior incurvation, was found between the fifth and ninth dorsal vertebræ, inclusive. (De Dysphagia Commentatio Pathologica, Auctore Gustavo Kunze, M. D. Lipsiae, 1820. 8vo. Pp. 92—98, et tabula prima.)

This case is not so accurately detailed by the author as could be wished. It leaves it doubtful, whether the disease began in the left lung and spread to the œsophagus, or began in the œsophagus, and thence, by the irritation which it induced, caused the vomica of the lung; or whether it was proceeding in both at the same time. It is unfortunate that the induration of the œsophagus is not more accurately described, so as to determine whether that induration were of the character of skirrhus, or were merely the cartilaginous induration sometimes observed after chronic inflammation. The case, nevertheless, shows the general progress of affections of this kind.

It is difficult to understand what is meant by viscid mucus changed into the hard consistence of callus. The œsophageal tissues must have been hardened, and proceeding to ulceration.

II.—*Cases in which the Perforated Œsophagus communicates with the Pleura.*

13. Mr Jonathan Wathen, in a paper containing General Remarks and Cautions respecting Cases in Surgery, in speaking of stricture of the œsophagus, makes the following observations:

" The ulcer in some instances erodes the thyroid and cricoid cartilages, or the *aspera arteria*, or else it penetrates laterally through the coats of the *gula*, through which the food and drink attempted to be swallowed make their way, and suddenly put an end to the patient's misery. I have opened several where these effects, with some others, were truly apparent, and have a drawing of one with a large hole in the side of the œsophagus, through which the food escaped into the thorax. I was concerned about a year since, with Dr Hunter, in a remarkable case of this kind, which I believe he will publish in the next volume of Medical Observations."—(General Remarks and Cautions respecting some Cases in Surgery. By Jonathan Wathen, Esq. Surgeon, &c. Memoirs of Medical Society. Vol. i. Art. xx. P. 278.)

14. In a boy aged 12 years, who was attacked with convulsions and died on the fourth day, the œsophagus presented in the middle of its length, on its right side, an irregular ulcer of about from six to eight lines. Two *lumbrici*, four or five inches long, occupied the lower part of the middle lobe of the lung; a third worm was still in the ulcer; a parcel formed by six of these animals entirely filled the œsophageal canal below the unnatural opening; other three worms were found in the stomach.

All these worms were dead at the time of examination, which took place three days after death.—(Journal Hebdomadaire, T. iv. No. 49, P. 365.)

The author expresses the opinion that the perforation was caused by the worms, but M. Vigla thinks that this is not possible.

III.—*Cases in which the Perforated Œsophagus communicates with the Right Bronchus.*

15. In a child of 3 years, who laboured under cough for six months, and afterwards difficult and painful deglutition, and who died phthisical, in the anterior part of the œsophagus, half an inch below the bifurcation of the *bronchi*, was a circular opening two lines in diameter, slightly dilatable, and capable of admitting a very large turkey-quill. Air blown into the larynx passed easily through the aperture. A probe introduced ascended between the œsophagus and trachea, and thence could be made without rupture to enter the right *bronchus*. The cavity thus formed was lined by a mucous membrane, red, injected, and containing mucous matter. At the lower part of this cavity, above and before the œsophageal opening, was a rounded aperture half an inch in diameter, corresponding nearly to the division of the *bronchi*. This aperture was parted in two by a bridle, the upper end of which was attached to the bifurcation of the *bronchi*, while the lower bifurcated end was fixed to each side of a notch of the right *bronchus*. A probe introduced by this last aperture followed the inferior division of the right *bronchus*, and was felt at the lower part of the right lung, through a moderate thickness of the pulmonary substance. All these apertures, as well as the slip or bridle by which they were separated, were covered by a violet mucous membrane completely organized. Several of the tracheo-bronchial glands were enlarged and tuberculated.

The middle lobe of the right lung was dense yet crepitating, and contained many minute tubercles. The lower lobe was solidified, and presented disseminated tubercules. (Leblond; These. Paris, 1824. No. 53, p. 21).

16. A cordwainer, aged 45, admitted to La Charité in the last degree of wasting, feebleness, and cachexia, and who died eleven days afterwards. Between the œsophagus behind and the right *bronchus* before, was a round cavity as large as a small nut, containing yellowish dirty matter of gangrenous aspect, and traversed by filaments of the pneumogastric nerve dissected. This cavity terminated at one side in the right bronchus immediately after its origin, on the other side at the œsophagus. The *bronchus* was eroded to a small extent, and all round it was grey in colour and gangrenous. It contained frothy greyish matter, similar to that contained in the intermediate cavity. The œsophagus at the corresponding part presented at its anterior wall an oblique opening, with irregular borders, capable of admitting a crow-quill.

IV.—*Cases in which the Perforated or Diseased Œsophagus is contiguous to a Lesion of the Pleura or Lung, and in a state threatening Communication.*

17. A young man, in his seventeenth year, had profuse hæmop-

tysis, thin purulent expectoration, and after several returns of the hæmoptysis, with difficult breathing, died. Besides adhesion of the *pleuræ*, and abundant tubercles in the lungs, the œsophagus, near its union, with the stomach, was eroded and perforated. (Lieutaud, Historia Anatomico-Medica, T. iii. Obs. 106. Lib. iv. ex Actis Physico-Med. Germaniæ).

18. A man aged 34, laboured under dysphagia, wasting, constrictive pain round the epigastric region, and nephritic symptoms; and in about seven months, after suffering from diarrhœa, died. The omentum contained purulent deposits. The intestines adhered generally to the peritoneum. Tubercles were formed at the surface of the liver, spleen, and stomach. The lower lobe of the left lung adhered to the pleura, and contained an abscess filled with purulent matter and viscid brown fluid. This abscess penetrated through the diaphragm and coats of the stomach into its cavity, the perforation in the diaphragm and stomach being large enough to admit the thumb. The œsophagus was sound to within two inches of the diaphragm, where it was converted into a white thick skirrhous substance, in which were many small ulcerations, each of which opened into this canal. (Difficulty of Swallowing, &c. from Skirrhous Tumours of the Œsophagus and Stomach. By Dr John Taylor, F. C. P. Edin. Medical Essays and Observations, Vol. ii. Art. 25, p. 325. Edin. 1737.)

19. A man aged 50, began in September 1752 to suffer from painful dysphagia, the pain extending from the site of the cardia along the œsophagus. He became hectic, emaciated, and died 18th April 1753. In the left lung, where it adjoins to the œsophagus, was an extensive *vomica*, from which issued dull yellow purulent matter. At the cardiac orifice of the stomach was a tumour two inches broad, hard, and narrowing the orifice of the stomach, so that the little finger could scarcely enter it. This hard growth consisted of skirrhous tubercles, while the membrane intermediate between the external and internal coats of the stomach was converted into a hard, white, elastic, cartilaginous substance. (Epistol. ab Eruditis Viris ad Alb. Haller, Script. Pars i. Vol. iii. 603 and 611. Dabat. Amstelædami, Jo. Steph. Bernardus. 21st April 1753.)

20. A boy, aged between 12 and 13 years, began in December 1807 to suffer from cough, oppressed breathing, expectoration of matters, first mucous, afterwards purulent and muco-purulent, and under these symptoms pined away and died tabid in March 1808. Besides tubercles in the left lung, some disseminated tubercles in the right lung; enlarged bronchial glands compressing the *trachea* and *bronchia*, and tuberculation of the omentum, the posterior and right lateral wall of the œsophagus was pierced by two round openings, terminated by bridles, which were lost in the

internal membrane. These openings terminated in a sac which adhered above to the lower, posterior, and internal part of the right lung, and which below, rested on the lobule of Spigelius. This sac contained some blackish fluid, similar in colour and consistence to that which the child had vomited on the two last days of life. The external wall of the sac appeared formed by the external membrane of the œsophagus. (M. Hallé, in Journal de Medecine de Corvisart, Leroux et Boyer, Janvier 1808. T. xv. p. 249.)

V.—*Cases in which a Foreign Body introduced into the Œsophagus has found its way outward by means of a fistulous passage through the Chest.*

21. A robust young man, aged 22 years, serving in the campaign of Piedmont, received, on the 14th April 1686, a musket ball between the tenth and eleventh thoracic vertebræ in the dorsal region. As no bleeding followed, the wound was enlarged by the bistoury; but neither blood nor ball escaped. He was desired by the surgeon to cough. Only some grains of rice which he had taken at last meal came away. The wound healed up, and the patient recovered. He further acquired so much strength, though fed on bread and water in prison, that he made his escape in February 1687, with some companions, and fortunately reached Switzerland amidst severe cold, and through roads covered with snow. He then turned to country labour; but about the end of September, during vintage, after having carried for several days on his shoulders heavier loads than usual, he was attacked first with difficulty of breathing, then fever, thirst, restlessness, delirium, and pain in the head and chest. These symptoms proceeded, and became aggravated; and on the 10th October the patient died.

The right lung adhered to the pleura, to the diaphragm, and to the mediastinum. Two fingers-breadth from its apex was found, in the substance of the lung, a leaden ball, enclosed in a proper sheath. The course of the ball could be followed from the site of the external wound to the cyst in the lung united together by adhesions; but it was impossible to recognize the vestiges of the lesion of the œsophagus. (Jacob Harder, Miscellanea Curiosa, Anno 1690. Obs. xciii. p. 158.)

Excepting for the rice grains discharged at the wound, it might be doubted whether the œsophagus was wounded at all. The case appears to be more like one of those in which the ball was, from the first, lodged in the lung, without affecting the œsophagus.

22. *An ear of grass swallowed; pneumonia; abscess in the walls of the chest; escape of the ear of grass.*—Some young persons were amusing themselves in trying whether, with an ear of grass placed on the tongue, they could pronounce certain words without swallowing the ear of grass. Two of these young persons

placed the awns first, and the opposite end outwards, and when they tried to speak, they swallowed the ears, but suffered from this no inconvenience. A third, aged about 16 years, placed the ear in the opposite direction on his tongue, and scarcely had he pronounced the two or three words agreed on, than the ear slipped down the throat. The young man immediately was deprived of the power of speech, and breathed with such difficulty, that he appeared to be suffocated; and in this state he remained several minutes. All means were used by his companions to make him eject the foreign body, but all were unavailing. The fits of choking, however, were abated, though breathing was very much oppressed. Next day the patient was attacked by shivering, followed by fever, cough, spitting of blood, and all the symptoms of a formidable disease of the lungs. Active remedies were employed.

On the seventh day of the disease, a tumour the size of an egg appeared between the sixth and seventh true ribs, causing acute pain. Suppuration followed, and the abscess opened of itself on the thirteenth day, when, after the discharge of much fetid matter, the mother of the patient withdrew a body which turned out to be the ear of grass. The young man completely recovered.

Labath, who communicated this case to Hevin, was of opinion that the ear of grass had slipped into the windpipe. M. Vigla and Hevin think that it was in the œsophagus. It is not very easy to decide. But the history of similar cases inclines us rather to the opinion of Labath, that the ear of grass dropped into the larynx and thence into the trachea and bronchus. It appears that the abscess was formed in the left side, three inches below the left nipple.

23. *An ear of grass swallowed by a child of six months; escape by an abscess in the back.*—A child of six months swallowed an ear of grass with which he was amusing himself. The accident was followed by violent coughing, which, however, did not favour the descent of the body, because the awns were so disposed that they should have made it reascend. In the posterior part of the chest considerable inflammation took place, and terminated near the fifth rib in an abscess, in which the ear of grass was found.

24. A girl of one year swallowed an ear of corn which she was holding in her mouth. Violent coughing immediately ensued. On the fifteenth day the patient discharged fetid pus by vomiting; and on the same day appeared a tumour on the right side near the superior ribs. The surgeon felt fluctuation. He opened the abscess, and withdrew the ear of corn, which presented itself first, and then followed much matter. Air used to come through the opening. The child recovered perfectly in five weeks. (Ledelius, quoted by Hevin, p. 414.)

It seems doubtful whether in either of the two last mentioned cases, any more than in the 21st and 22d, the foreign body had really entered the œsophagus. The immediate symptoms following the accident lead rather to the conclusion, that these bodies had entered the larynx and descended to the *bronchi*; and the fact of air issuing from the interior of the abscess in the 24th case, though not conclusive against its proceeding from the œsophagus, yet favours as much the idea that the abscess communicated with the lungs.

The three last given cases, therefore, must be regarded as at least doubtful and uncertain; and probably the one from Harder, immediately preceding those, is not entitled to be positively placed among the examples of unnatural communication between the œsophagus and respiratory organs.

On the other hand, examples of this communication, the effect of disease, originating in general in the œsophagus, are not uncommon. That tube is liable not only to inflammation of an acute form affecting its mucous membrane and submucous tissue, but also to chronic inflammation and to different forms of induration. Of these four have been distinguished by pathological writers; the callous (*induratio callosa; skleroma callosum*); the gristly (*induratio cartilaginea*), (*skleroma cartilagineum*); the bony (*induratio ossea; skleroma osseum*); and the skirrhous; (*skleroma skirrhosum*). Some of these it is not always easy to distinguish in actual practice; for instance, the callous and the cartilaginous; and probably various forms of what have been mentioned as cartilaginous induration, are examples of incipient or established *skirrhus.* Many of the examples of stricture of the *œsophagus* causing *dysphagia,* are manifestly instances of this cartilaginous degeneration or transformation; and it is most probably one of the forms or stages of skirrhus. On the other hand, the mucous membrane of the œsophagus is liable, under the influence of chronic inflammation, to become hard, firm, and unpliant, somewhat like soft cartilage, or rather like hard leather.

In either of these states, but especially in that of skirrhus, the hardened and morbid structure is liable not only itself to become the seat of ulceration, but to excite ulceration in the adjoining tissues, and especially in the cellular tissue connecting the œsophagus to the windpipe, and to the posterior mediastinum. Besides the instances of this already mentioned as having proceeded to perforation, instances are mentioned by Sandifort in his Museum Anatomicum,* by Le Cat, and by Zeviani. In the case given by Le Cat, several holes were found in the windpipe; and the œsophagus was cancerous and ulcerated immediately behind the larynx.† In the case given by Zeviani, there is reason to believe, from the appearances, that the *trachea* was affected before the œsophagus.*

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* Museum Anat. Lug. Bat. Vol. i. Sect. v. p. 243, No. xiv., tab. cvi.

† Recueil d' Observations des Hopit. Milit. T. 1. 400.

We have added one case, in which the ulcerated and perforated œsophagus communicated with the lung. Another may be subjoined, in which the perforated œsophagus opened into the posterior mediastinum.

25. A female at the age of 52, began to suffer in the winter of 1782 from symptoms which she ascribed to disorder of the stomach. She was emaciated, had dyspeptic symptoms, and difficulty in deglutition, when seen by Dr Garthshore in February 1783. Various means were employed, but the obstruction was increased, and became progressively more complete. She died completely worn out, partly by the disease, partly by the effects of mercurialization,—at that time a favourite remedy,—on the 9th of July 1783, and the body was examined by John Hunter the following day.

When the œsophagus was exposed through its whole course, it was found that the surrounding parts, where it passes below the division of the *trachea* (the mediastinal cellulo-filamentous tissue), were thickened and diseased, and contained an abscess which led into the cavity of the *œsophagus.*

The œsophagus at this part, when laid open, was in a state of ulceration on its inner surface for four inches in length, terminating at each end at once in a regular edge. This edge was a little elevated, as is frequently seen in bad or cancerous ulcers in other parts. Above and below this ulcerated space, the œsophagus was perfectly sound, being not even thickened. About the centre of the ulcerated space was the opening of the mediastinal abscess, or what may be supposed to be the continuation of the ulceration into the surrounding parts (the *mediastinum*), forming an ulcerous cavity, which was situate immediately below or between the division of the *trachea.*

The surrounding parts that were in some degree connected with the disease, at least by adhesion, were,—a part of the descending aorta, the posterior surface of the auricles, the basis of the lungs on the right side, the left *bronchus*, and some of the tracheo-bronchial glands.†

This case is important, and deserves attention in several circumstances, but in none more than in illustrating the progress of the species of ulceration, and the circumstances by which it is influenced. We have here an example of skirrhous stricture of the œsophagus, not only proceeding to its peculiar form of ulceration, but inducing in the adjoining filamento-cellular tissue, inflammation, and suppuration. Had the life of the patient been prolonged a few days, a communication must have taken place either with the lower end of the trachea or with the left bronchus. Had the abscess been a little higher, it would have opened a communication with the interior of the trachea. Had it been a little lower, it would most likely have laid open the left *bronchus* and the base of the right lung.

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* Memorie di Matemat e Fis. della Societa de Ital. Tome vii.

† A Case of Difficult Deglutition, occasioned by an Ulcer in the Œsophagus, with an Account of the Appearances on Dissection. By Maxwell Garthshore, M. D., &c. Medical Communications, Vol. i. Art. 20, p. 243, read 21st October 1783. London, 1784.

Similar examples of communication between the *œsophagus* and *trachea* are preserved in various Pathological Collections; one in the Museum of the University of Edinburgh (I. 47 a); two in the Museum of Guy's Hospital (1791 and 1793); one in the same Museum, in which the œsophagus opened into the lung, which then became gangrenous (1792); one in the Museum of the College of Surgeons of Ireland (*A. a. 50^5); and one in the collection of Mr Langstaff (871). In some instances it has been known that when the *œsophagus* was affected with this sort of ulceration from stricture, the introduction of a bougie terminated in the point of the latter going through the ulcerated part, and getting into the posterior mediastinum. Of this accident a remarkable example is preserved in the Museum of the College of Surgeons in Ireland (A. a. 44). Against this practice Mr Langstaff speaks decidedly, from observing the nature of most strictures of the œsophagus; and it may be safely asserted, that in the majority of instances of this disease, the use of the bougie is calculated to cause more harm than good.

The cases now given, excepting the two additional ones, are abridged from the reports given by M. Vigla. They are arranged in a different order, being placed nearly according to the chronological order in which they took place or were published. One case (5), which was in the second category, has been placed in the first, to which it appears more naturally to belong. With these exceptions, and some rectifications as to dates and other matters, in which errors had taken place, the cases are given nearly as they are recorded by the authors of them.

Various general conclusions are given by M. Vigla. Of these the most important are subjoined.

1. The œsophagus perforated, communicating with a cavity in the lung, in seven cases, 2, 3, 8, 9, 10, 11, 12.

2. The perforated œsophagus communicated with the lung ulcerated or diseased, in four instances.

With the pleura, in two cases.
With the right bronchus, in two cases.
With the trachea and right bronchus, in one case.
With the mediastinum, in one case.

The perforated œsophagus opened in a cavity contiguous to the lung in one case; it was close to an effusion within the right pleura in one case; and the œsophagus contracted and diseased, but not perforated, was contiguous to an abscess of the lung, and to a cavity in the lung, each in one case.

3. The right lung was affected in the greatest number of cases; namely, in ten; the left lung in three; both lungs in one case.

4. The morbid changes in the œsophagus were various. In five cases they were simple ulcer. In eight cases skirrhus. In two cases they were gangrene. In one it was fibro-cartilaginous induration. In four cases the changes were ill-defined.

M. Vigla undertakes, from the facts of fifteen cases, to fix the duration of the period of unnatural communication He infers that in one case the period was six months; in two cases four months; in one case one month; in one, one month ten days; in one, one month fifteen days; and in one case, only four days. It is obvious that it is impossible to fix any exact time for the period during which an individual lives with this sort of perforation. In most cases, after the communication with the windpipe has taken place, the termination of life is not remote.

6. The age at which this sort of lesion occurs depends on the pathological cause of the lesion. Though it may take place when dependent on simple ulceration in young persons, yet whenever it depends on skirrhousinduration of the œsophagus, the chief subjects of the lesion are persons up in years. Among twenty-one cases, two took place at forty-eight years; seven between fifty and sixty; two between sixty and sixty-five; and in three the age is not specified. The disease is more common in males than in females; the numbers being fifteen of the former, and five of the latter.

M. Vigla subjoins a series of general conclusions. But most of these have been already anticipated in one form or another.

The main object is to discover the means of making a correct diagnosis in this lesion. The existence of the communication may be suspected, if violent coughing be excited when attempts are made to swallow articles of food or drink. As these articles, in their passage down the œsophagus, get through the opening into the trachea, they cause as much irritation and feelings of impending suffocation, as if they were directly introduced by the larynx. The method adopted by Dr Coldstream and Dr Paterson is also useful as a means of diagnosis; because, if upon the introduction of the tube, air were found to be coughed or expired through it, then the inference must be that the tube is at the orifice of the communication.

ART. XI.—*On a Method of making Trusses more Durable by Galvanizing their Springs.* By THOMAS STRATTON, M. D., Edin.; Surgeon, R. N. (In a letter to Sir William Burnett. M. D., K.C.H.)

THE manner in which a truss becomes worn and broken, so that the wearer has to procure a new one, is generally from the perspiration causing the spring to rust, and after this has gone on for some time, it breaks from a very slight cause.

I have often observed the frequency with which seamen-pensioners, R. N., requiring to wear a truss, apply to have a new one given to them; and, on examining the returned and broken one, the fracture in the spring is found at that part where it is most rusted. On account of rusting from this cause, a labouring man requires a new one more frequently than other classes; and in hot climates, they do not last so long as in temperate ones.

Some time ago it occurred to me, that to have the steel spring galvanized would prevent it from rusting; and I gave a spring (child's size) to the Galvanized Iron Company (3, Mansion-House Place, London), for them to galvanize. They were not in the habit of galvanizing steel, and I was doubtful whether or not its elasticity would be impaired by the process. Next day, on receiving the spring, I found that the elasticity was a little less, but still sufficient for the purpose required; and if, for some cases, more elasticity be desired, it would be easy to have the spring a little thicker. The acid part of the sensible perspiration will exert some corroding action on the galvanized steel, but the amount of this will be very trifling. With regard to the cost of the process, the expense of galvanizing iron is about one-third of the value of the iron.

A working man requires a new truss every year, or every two or three years,—we may take two years,—and if we suppose the instance of a person who lived thirty years after requiring to wear a truss, he will thus have worn out fifteen trusses in that time; whereas a single galvanized truss would have lasted the whole time, as far as decay from rusting was concerned. The leather part of a truss is not very liable to wear, and if it do, it may be repaired by the patient himself.

Where trusses are purchased on the large scale, as for the navy and army, the saving effected by purchasing durable trusses would in a year or two be very evident. I prefer under-rating the amount of this saving, and I think I do so when I suppose that of the present expense, four-fifths at least would be saved by the improvement now proposed. Besides this economical advantage, the inconvenience and danger which at present sometimes occur when a truss unexpectedly gives way, will be in a great measure or entirely prevented.

In this age of invention and re-invention, one may make the mistake of thinking a proposal an original one, when it has already been offered by others; but after conversing with various medical men and truss-makers in Edinburgh and London, I cannot find that the above improvement has been suggested by any one. In the event of galvanized springs coming into use, they will, perhaps, meet with some opposition, as the trade of the truss-makers will be thereby a little injured.

The Galvanized Iron Company galvanize anchors, chains, &c. which, after being for months exposed and in use, are found not to have suffered in the least from rust. I have shown the spring I had galvanized to several surgeons, all of whom were satisfied with the amount of elasticity; while its non-liability to rust gives it an evident superiority over the spring now in use.

15, *Bernard Street*, *Leith*,
3*d October* 1848.

Art. XII.—*Tables illustrating the Effects of the Employment of Blood-letting in the Treatment of Cholera, in the Castlehill Hospital in* 1832. By G. Hamilton Bell, Esq., F.R.C.S.E.

Doubts have recently been expressed as to the efficacy of blood-letting in the treatment of cholera. Certainly, in attempting to treat a disease so rapid in progress and so frequently proceeding to the fatal termination, good grounds are afforded for calling in question the efficacy of any remedy or any therapeutic method. In the stage of collapse, or when the disease is fast verging on that stage, no remedies appear to have much effect; and when recoveries are effected from that condition, it is probable that they are the result either of the means previously put in use, or they are spontaneous, and independent of medical treatment.

I have no wish here to repeat what I have so fully stated in my work on this subject. But as I fear that blood-letting in cholera, notwithstanding its well-deserved estimation in the treatment of the disease in India, has been not only overlooked in the instructions of "Boards of Health," but by those practising in the epidemic, to most of whom probably it is a new disease, I think the publication may be useful of tables, in a very concise form, of the result of venesection treated in the Castlehill Hospital, not only during the time I had a charge in it, but afterwards under my friend Dr Craigie.

My own opinion of blood-letting in cholera is, that it acts *mechanically*, removing from the system a portion of venous blood, which early in the disease clogs the vital organs, and retards or prevents reaction; and I should therefore endeavour, in every case of *cholera asphyxia, to bleed from the veins.* My rule is to bleed till the stream improves, and the blood, from being black and grumous, assumes a more normal character.

The following tables present a view of the effects of this agent, which will enable readers to form their own judgment. They are deduced from the effects of blood-letting in cases in which that remedy was employed in the Castlehill Hospital in the year 1832. Blood-letting was in these cases employed as one remedy, without neglecting others which were also employed.

Dr Craigie succeeded to my charge in the hospital in July 1832.

In these tables the names are given in initials. In the column "Occupation," P. is given for public female, W. for widow, M. married woman, S. for servant, N. S. for not stated. In the column "Stage of Disease," Col. is given for Collapse; V. C. for Verging on Collapse; and F. S. for First Stage.

In the column of treatment, as many of the patients were subjected to much the same remedies, the terms G. L. T. are used to designate General and Local Treatment, understanding by this the use of sinapisms, stimuli, calomel and opium, Dover's powder, and laxatives;—all those measures, general and local, which were employed to suspend the discharges, restore heat and the secretions, and relieve particular symptoms.

In the column "Event," C. is given for Cured, and D. for Died.

Castlehill Hospital, Edinburgh.—Tabular View of Cases in which Venesection was practised—*Males.*

Name.	Age.	Occupation.	Admitted.	Stage of Dis.	Habits.	Treatment.	Event.	Date of
R. S.	...	Porter	Mar. 5	R.	Dissipat.	Vs. ad 11 oz. G. T.	D.	Mar. 14
J. W.	73	Carter	Mar. 14	V.C.	Intemp.	Vs. ad 12 oz.	D.	Mar. 16
J. B.	24	Labourer	Mar. 24	Col.	Not stat.	Brandy, vs. ad 11 oz.	D.	Mar. 24
F. (D.)	...	Gardener	Mar. 28	Col.	Not stat.	Sinap. vs. ad 6 oz.	D.	Mar. 28
J. N.	33	Printer	Ap. 23	V.C.	Intemp.	Vs. ad 12 oz. G. T.	D.	Ap. 24
D. S.	50	Watch m.	Ap. 24	F. S.	Temp.	Vs. ad 20 oz. G. & L. T.	C.	May 1
J. B.	47	Wright	May 2	V.C.	Not stat.	Vs. ad 15 oz. G. T.	D.	May 2
M. T.	35	Porter	June 30	F. S.	Intemp.	Vs. ad 35 oz. G. T.	C.	July 4
J. B.	47	Labourer	July 1	F. S.	Intemp	Vs. ad 16 oz. G. T.	C.	July 9
J. D.	32	Labourer	July 5	F. S.	Temp.	Vs. ad 34 oz. G. T.	C.	July 10
D. M'A	12	Vagrant	July 16	F. S.	...	Vs. ad 6 oz. G. T.	C.	July 24
A. M'C.	17	Cork-cut.	July 19	F. S.	Not stat.	Vs. ad 12 oz. G. T.	C.	July 24
J. S.	37	Porter	July 22	F. S.	Intemp.	Vs. ad 24 oz. G. T.	C.	July 30
W. T.	74	Grinder	Sept. 6	F. S.	Dissipat	Vs. ad 12 oz. vs. ad 12 oz. G. T.	D.	Sept. 9
A. C.	61	Pensioner	Sept. 7	V.C.	Intemp.	Vs. ad 8 oz. G. & L. T.	D.	Sept. 8
J. M'L.	39	Baker	Sept. 11	F. S.	Intemp.	Vs. ad 28 oz. cal. op. G. & L. T.	C.	Sept. 21
T. S.	49	Vagrant	Sept. 26	F. S	Dissipat.	Vs. ad 23 oz. cal. op. G. T.	C.	Sept. 28
A. E.	40	Joiner	Sept. 27	Col.	Regular	Cal. op. vs. ad 15 oz. Hirud. 6 reg. ren. repr. Vs. ad 10 oz.	D.	Oct. 1
W. S.	20	Black sm.	Oct. 2	F. S.	Not stat.	Vs. et pil. 2. G. T.	C.	Oct. 8
S. R.	38	Cop. print	Oct. 28	F. S.	Intemp.	Vs. ad 30 oz. cal. hiru. tem. G. T.	C.	Nov. 5
J. M'K.	66	Dyer	Nov. 2	F. S.	Not kno.	Vs. ad 12 oz. cal. op. G. T.	C.	Nov. 9

Castlehill Hospital, Edinburgh,—Tabular View of Cases in which Venesection was practised—*Females.*

Name.	Age.	Occupation.	Admitted.	Stage of Dis.	Habits.	Treatment.	Event.	Date of
B. M'I.	.	P.	Jan. 27	Col.	Intem.	Emet. sinap. vs. ad 14 oz. G. T.	C.	Feb. 16
J. S.	25	P.	Feb. 16	Col.	Dissip.	Emet. sinap. vs. ad 8 oz.	D.	Feb. 16
I. J.	30	N. S.	Mar. 13	V. C.	Not kno.	Vs. ad 12 oz. brandy.	D.	Mar. 14
Mrs G.	40	W.	Mar. 13	Col.	Not kno.	Vs. ad 16 oz. brandy. G. T.	D.	Mar. 19
M. G	...	M.	Mar. 16	Col.	Not kno.	Vs. ad 6 oz. brandy.	D.	Mar. 16
M M'K	50	M.	Mar. 17	F. S.	Doubtful	Vs. ad 12 oz. p. dom. G. T.	D.	Mar. 24
M. B.	...	N.	Ap. 10	F. S.	Suspiciou	Vs. ad 15 oz. cal. et op.	D.	Ap. 11
M. R.	26	P.	May 22	F. S.	Dissip.	Brandy, vs. ad 10 oz. vs. ad 8 oz.	C.	June 4
M. H.	49	M.	May 23	V. C.	Intem.	Vs. ad 24 oz. calom. brandy.	D.	May 28
M. F.	53	M.	June 24	Col.	Intem.	Brandy, cal. et op. vs. ad 20 oz.	D.	June 26
J. J.	45	W.	July 2	F. S.	Dissip.	Vs. ad 24 oz. cal. op. G. T.	C.	July 9
M. S.	22	P.	July 3	F. S.	Intem.	Vs. ad 24 oz. cal. op. G. T.	C.	July 12
M. H.	21	P.	July 3	F. S.	Dissip.	Vs. ad 24 oz. cal. op. G. T.	C.	July 7
E. M'A.	18	...	July 3	F. S.	Debilitat.	Vs. ad 12 oz. cal. op.	D.	July 4
I. M'I.	29	M.	July 3	F. S.	Regular	Vs. ad 9 oz. cal. op. G. T.	C.	July 10
C. F.	25	P.	July 6	F. S.	Intem.	Vs. ad 14 oz. cal. op. G. T.	C.	July 14
M. W.	24	W.	July 9	F. S.	Regular	Vs. ad 20 oz. cal. op. G. T.	C.	July 18
E. D.	39	P.	July 10	F. S.	Not kno	Vs. ad 10 pul. rh. c. G. & L. T.	C.	July 14
M. P.	39	...	July 11	F. S.	Not kno.	Vs. ad 13 oz. cal. et rh. G. T.	C.	July 15
E. A.	50	W	July 15	F. S.	Not kno.	Cal. et op vs. ad 6 oz. G. T.	D.	July 24
A. C.	50	W .	July 16	F. S.	Intem.	Vs. ad 18 oz. G. T.	C.	July 21
C. T.	50	W	July 16	F. S.	Dissip.	Cal. et op. vs. ad 10 oz. G.&L.T.	D.	July 30
M M'D	29	M.	July 17	F. S.	Intem.	Vs. ad 20 oz. ol. ricin. G. T.	C.	July 20
A. L.	28	S.	July 17	F. S.	Not kno.	Vs. ad 16 oz. G. T.	C.	July 21
I. A.	39	M.	Aug. 6	Fev.	Regular.	Vs. ad 20 oz. cal. et op. G.&L.T.	C.	Aug. 10
A. M'C.	32	P	Aug. 15	F. S.	Dissipat.	Vs. ad 18 oz. cal. op. G. T.	C.	Aug. 18
C. J.	24	...	Aug. 19	F. S.	Doubtful	Vs. ad 10 oz. cal. op. G. T.	C.	Aug. 27
C. N.	26	P.	Sept. 4	F. S.	Dissipat.	Vs. ad 22 oz. cal. op. vs. ad 10 oz.	D.	Sept. 15
C. D.	26	M.	Sept. 6	F. S.	Not kno.	Sinap. epig. vs. ad 15 oz.	C.	Sept. 18
M. B.	20	P.	Sept. 9	Col.	Not kno.	Do. cal. op. vs. 5 oz. G.&L.T.	C.	Sept. 15
J. S.	32	P.	Sept. 10	F. S.	Intem.	Vs. ad 10 oz. cal. op. G. T.	C.	Sept. 22
M. G.	...	...	Sept. 15	F. S.	Not kno.	Vs. ad 16 oz. cal. op. Hirud. 24	C.	Sept. 19
M. G.	22	P.	Sept. 17	F. S.	Not kno.	Vs. ad 14 oz. cal. op. G. & L. T.	C.	Sept. 21
Mrs C.	36	M.	Sept. 21	F. S.	Regular.	Cal. op. brandy, vs. ad 10 oz. G. T.	C.	Oct. 4
M. B.	18	P.	Sept. 26	F. S.	Dissipat.	Cal. op. brandy, vs. ad 10 oz. G. T.	C.	Oct. 2
M. H.	20	P.	Oct. 3	F. S.	Intem.	Vs. cal. et op. G. T.	C.	Oct. 8
C. R.	26	..	Oct. 16	F. S.	...	Vs. ad 24 oz. G. & L. T.	C.	Oct. 19
M. J.	17	P.	Oct. 18	F. S.	Intem.	Vs. ad 20 oz. cal. et op. G.&L.T.	C.	Oct. 25
Mrs T.	40	W.	Oct. 19	F. S.	Regular.	Vs. ad 15 oz. cal op. G. & L. T.	C.	Oct. 26
Mrs H.	27	W.	Oct. 21	I. F.	Regular.	Vs. cal. et op. G. T.	C.	Nov. 5
Mrs S.	40	W.	Oct. 30	F. S.	Not kno.	Vs. (before admis.) c. op. G.&L.T.	C.	Nov. 3

The whole number of cases treated in this manner was sixty-two ; forty-one females and twenty-one males.

The whole deaths in this number appear to have been twenty-one, or about one-third ; twelve females and nine males. The proportion of deaths among females is smaller than that among males.

P. S. by Dr Craigie.—My experience, both within and without the Hospital, enables me to say, that I entirely concur in the justness of the sentiments expressed by my intelligent friend Mr H. Bell, as to the efficacy of blood-letting, when judiciously and seasonably used, in the treatment of cholera.

PART II.

CRITICAL ANALYSIS.

Art. I.—*Observations on some of the Parts of Surgical Practice; to which is prefixed an Inquiry into the Claims that Surgery may be supposed to have for being classed as a Science.* By John Painter Vincent, late Senior Surgeon to St Bartholomew's Hospital. London, 1847. 8vo. Pp. 364.

This volume contains the observations and reasonings of a surgeon of great experience, who thinks for himself, and who has not allowed to pass before him unimproved the multiplied facts furnished by his position as surgeon to the largest and most ancient hospital in the metropolis.

It begins with an inquiry or discourse on the claims which surgery possesses to rank as a science. Such an inquiry may appear to be almost, if not altogether, superfluous in the present day, in which, we believe, few sensible persons whose opinion can be worth having, will doubt, that there is a science of surgery, while it is equally impossible to doubt that there is an art of surgery. If, however, any persons do entertain doubts of this kind, they will find in the discourse now mentioned sufficient ground for abandoning them. The discourse is learned, philosophical, and dignified. Yet, with deference to the excellent author, it seems a waste of time and intellect to attempt to prove what is almost self-evident to those, who understand the relation between science and art. Every art, or practical department of human knowledge, must rest on a body of principles, the knowledge of which constitutes its science; and no art can be successfully or efficiently practised without the knowledge of these principles. Conversely, every series of scientific facts or principles admits of practical applications. The art necessarily exists, though in a rude state at first; and most commonly the principles, or scientific parts, afterwards become the subject of inquiry; and this is the main, if not the sole reason, why, with superficial observers, the existence of such a thing as science is, in certain cases, doubted and denied. Though surgery is practised as an art, and exercised often as a trade, there can be no doubt that its practical applications rest on scientific principles; and that, both truly and abstractly speaking, there is a science of surgery, and surgery is a science.

Mr Vincent, nevertheless, expresses with confidence the opinion, that surgery hardly yet presents itself with claims to be called a science, in the just and legitimate acceptation of the word. The grounds of this opinion deserve examination.

"It is a fact admitted by all observers," says Mr Vincent, "that great and persisting processes of nature are carried on by an undercurrent. It is not by looking on the swelling and impetuous wave beating against breakers, but in observing what is going on in the gentle ripplings of the ebb-tide, that the philosopher is best enabled to institute his inquiries, and to draw his safest conclusions. It is so in medical practice. While the practitioner, relying upon the efficiency of his remedies, is confidently expecting to prove their curative powers, he is obliged to acknowledge that disease unalterably advances to a destructive end. And, on the other hand, the attendant may sometimes find that, when he despairs of his means, the processes of nature, quietly working under a concerted influence, slowly perfect the unlooked-for cure. The medical man tasks his memory to the suggestion of some expedient to meet the various changes that occur in disease, thinking to display the cleverness of his art in the application of it to every contingency; but this ends in a failure, and he proves that his profession is conjectural and defective, and not a science. In this way it is that many persons, particularly those who are well educated, set but little value upon the remedies that are prescribed for them. Ingenuousness in medical men, as in all, would do more to elevate the character, by candidly admitting the limits of their means, than any attempt to display surpassing ability. Science is of itself clear as light, and not 'mera palpatio, quali homines in noctu utuntur, omnia pertentando si forte in rectam viam incidere detur.'"*

Now, it must be allowed that part of what is here said is true, but part, it must also be observed, contains some error. With regard to the statement, "that great and persisting processes of nature are carried on by an under-current,"—that is merely saying that many of the processes of nature, as they take place either in the external world or in the human body, are either such, or take place under such circumstances, that they elude observation. We observe the result after a lapse of years or months, but we do not perceive the individual steps of that process or those processes which lead to the result. It does not, however, from this, follow, that we are never to become acquainted with those processes, or be capable of recognizing their evidence early, and foretelling their termination. Careful observation and patient watching make the human race acquainted with many things, and the nature of many processes, which were either wholly unknown or imperfectly understood by previous observers. Accident has made known many more things which were formerly unknown or misunderstood. Modern navigators and observers of marine phenomena have ascertained the formation of islands gradually rising in the bottom of the ocean from the incessant labours of multitudes of minute animals, which secrete and excrete lime. Land seems to be gained from the sea, at the outlets of large rivers, by the immense quantity of disintegrated rocks and decayed vegetable matter brought down by the currents of the rivers, and deposited in the form of alluvial matter at the points where they join the waters of the deep. Looking to surgery, how little was accurately known sixty years ago of the true nature of hernia, aneurism, and diseases of the joints? It may be safely asserted, that a young man who has devoted moderate attention to anatomy and surgery for the space of three or four seasons, has a much more correct knowledge of the nature of the different forms of rupture than was possessed by Cheselden and Bromfield, Morand, Petit, and Richter. Observation and repeated dissection have taught the surgeons of the present day that aneurism, though apparently a local disease, is really one depending on general causes which act on the whole arterial system. The same instructors have taught, that the disorders which seventy years ago were assembled under the general and vague denomination of *white swelling,* are numerous, and that the articular tissues are liable, either separately or conjointly, to several different affections, which require different modes of treatment, and, above all, that amputation is by no means the best remedy for them.

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* Bacon.

The collection of these facts, and their proper comprehension by the human intellect, constitutes the science of surgery, and their application in practice constitutes the art. And in taking this view, we differ little, if at all, from the sentiment of the author, when he states that science is the comprehension of truth in any of the departments of knowledge over which the mind has the power of giving certainty to the results of its investigations.

The same, however, we cannot say, when we consider the frequent and admitted uncertainty of the operation of remedies, and the steady progress which certain forms of morbid action pursue to disorganization or destruction of the tissues in which they take place. And this peculiar difficulty requires not only great care in distinction as to the action of remedial agents, but also as to the nature of morbid actions. We know that a certain dose of calomel will purge, while in another dose it will salivate; that a certain quantity of tartar-emetic will sicken and cause diaphoresis;

and that a certain amount of opium will suppress the alvine discharges, stupefy, alleviate pain, and cause the patient to sleep. But we are not by any means certain, that any given quantity of calomel will cure a disease of the liver, as was formerly taught with much confidence, or that the exhibition of a certain number of grains of tartar-emetic for a given time will prevent the lung from becoming hepatized, or that opium given in certain doses is sure to cure an attack of diarrhœa, dysentery, rheumatism, neuralgia, or cholera. The affection of the liver, which it is proposed to cure by the exhibition of calomel, may be of that nature that no quantity of calomel or any other agent can affect. It may be kirrhosis, or it may be fatty liver, or it may be enkephaloma beginning to be formed in the gland. In the case of the lungs, on the other hand, those changes of structure may have already taken place, which no remedies can prevent, and certainly none can remove. The lung may be extensively infiltrated with blood, *liquor sanguinis*, and purulent globules. *Lastly*, in an attack of diarrhœa or dysentery, so great mischief may already have been caused in the intestinal mucous membrane, that, though by means of opium, the discharges undergo a temporary suspension, yet the morbid action, which is the effect of the diseased state of the bowel, constantly recurs; digestion and nutrition are interrupted in their most essential stages. The patient is worn down to the last stage of emaciation and debility, and finally sinks under the disease,—an unequivocal proof of the inefficiency and uncertainty of medicine, and the small degree of power which all means exert over certain forms of disease.

The knowledge, nevertheless, of all these facts, constitutes the science of medicine; and the knowledge of similar facts, relating to various local diseases, constitutes the science of surgery. That the action of various agents on the human body is uncertain, and does not always remove disease, is as much a part of science as the knowledge, that the squares of the two sides of a right-angled triangle are equivalent to the square of the hypotenuse. The uncertainty, also, and the inefficiency in the removal of disease, is more a therapeutical than a physiological fact. A certain dose of arsenic will with great certainty produce death. A series of very small doses, though sometimes capable of curing an ague, will not always do so. The physiological operation is the certain one; the therapeutic is, in all cases, the uncertain operation.

The above-given exposition of the views of Mr Vincent present on the question whether surgery is a science, an error derived from a source, from which we could scarcely expect that a man of liberal education and comprehensive views would have sought it. The question may always be stated, in every inquiry of this kind, what is science? The definition given by Mr Vincent will show.—Science is represented as the "clear knowledge of subjects presented to the mind, founded upon self-evident principles, with consequential and clearly-connected demonstrations, which collectively amount to a body of demonstrated truths." He allows that this train of operations can be only carried on by the intellect fully and brilliantly shown in mathematical inquiries. Again he informs the reader, that "science being a series of demonstrations derivable from absolute truths, the senses cannot afford that sort of intelligence of things upon which the principles of science may be founded." Again, "science is a system of demonstrations, and a demonstration must engage the mind in deliberations; deliberation is the employment of the intellect upon a series of inquiries into the relations of things."

Now, the obvious objection to the definitions and descriptions here given is, that they are too strict and too limited. They apply only to the exact sciences, geometry and its applications, and they do not admit of application to those objects and processes which are not under the influence of mathematical and physical laws. The only department of medical and surgical science which can be said to admit of demonstration and demonstrative evidence, is anatomy, particularly structural anatomy, as displayed by microscopical examination, and certain parts of chemistry,—especially the union of substances in definite proportions. But even in anatomy, the demonstration, the evidence, and the description is different from that which takes place in geometry. There is no exact and invariable correspondence of points, lines, and surfaces; and any attempt to discover and establish such correspondence would end in unprofitable and delusive labour. Still more impossible is it to apply mathematical evidence and demonstration to the facts and principles of physiology and pathology. The processes of living bodies, although they are exact in their own way, do not admit of this form of exactness; and in the morbid state, they are equally incapable of being subjected to rule and compass. Neither bones nor muscles present in their configuration and position any similitude to any exact mathematical figures; nor can the vigour and energy with which the latter act be estimated by numerical force. Physiology and pathology, the knowledge of the actions of living bodies and the laws by which they are regulated, and the knowledge of the morbid deviations to which they are liable, are not, in short, among the exact sciences. This, however, does not constitute a sufficient reason for excluding them from the order of sciences. Science consists in the knowledge not of demonstrative truths, but of truths obtained by whatever means, or the knowledge of general abstract principles derived from all good sources; and certainly physiology and pathology, whether medical or surgical, is entitled to this distinction.

It is surely unnecessary, at least it ought to be unnecessary, to remind the reader, that science is of two kinds, exact and inexact. The exact sciences belong to the domain of mathematics and geometry, and their applications, astronomy, navigation, mechanics. The inexact sciences, on which we cannot obtain demonstrative evidence, but only probable, belong to that mixed and uncertainly-defined realm which presents the moral and metaphysical sciences, ethics, politics, jurisprudence, psychology, logic, political economy, and that comprehensive division of human knowledge which forms the philosophy of living bodies, vegetable and animal. It is under the latter head that medicine and surgery must be arranged; and though their principles partake of the uncertainty which attends the actions of all living bodies, yet these principles are most justly entitled, in reference to their comprehension by the human mind, to be denominated science. It is no objection to this admission, that the uncertainty and irregularity of these actions are invariably more considerable in the actions of the animal than in those of the vegetable world; that the vegetable tribes present in their various functions a degree of regularity and exactness, for which we look in vain in those of the animal kingdom; and that in the lower divisions, as they are termed, of the animal kingdom, the various actions and functions are much more regular and less liable to deviation than in the higher divisions of that kingdom. The human body, the body of that being who stands at the top of all, presents, of all the genera of the animal world, the greatest amount of irregularity, the greatest degree of deviation from strict exactness; and hence medicine and surgery, conversant with the diseases of this being, partake of the same want of exactness. Neither the laws which regulate the living actions and functions of the human body, nor those to which the disorders of the human body are subject, can be stated in the same terms, or enunciated in the same form, as those by which the phenomena of brute matter are regulated, can be expressed.

Yet even in the healthy actions and morbid processes of living bodies is observed a form and kind of regularity which is characteristic of them, but which is altogether different from that observed in the various processes of the inorganic world. The processes of circulation, absorption, and secretion, in living bodies, proceed with a degree of constancy, regularity, and energy, which show how important and necessary they are to the well-being of the individuals. Yet in all plants, and in many tribes of animals, in cold seasons and countries, these processes are as it were dormant, inactive, and suspended. During the periods of activity also, they are liable to be augmented and diminished in energy; and were they not so, neither plants nor animals would suffer that final and complete interruption of function called death.

The regularity, however, of these actions, and the measure of that regularity, are very different indeed from those observed in the inorganic world. In the latter, all is regulated by weight, measure, and relative position; and by ascertaining these points, exact conclusions, to an inconceivable degree of minuteness, may be certainly attained. When the seaman wishes, in the midst of the trackless ocean, to ascertain the latitude in which his vessel lies, at any given time,—the altitude of the sun during the day, or of the pole-star during the night, determined by his sextant, furnishes him with the required information to within a mile or parts of a mile. When he wishes to determine the longitude in which the vessel floats at any particular hour, the moon,—placed as a sure witness in heaven, announces by its position, ascertained by the same instrument, and an easy calculation, the difference of time and the consequent difference of position, east or west, between the spot in which the vessel then floats, and that in which she lay three weeks previously. Even any required point in the ocean may be found in the same manner with great certainty; and the exact situation of a sunken rock may be determined within one or two miles.

The measure of the actions and functions of animal bodies are not only determined by different modes, but, in determining them, many more circumstances, all of action more or less irregular, must be taken into account. Though it is of great moment to observe magnitude, position, and figure, yet these properties are so much influenced by the actions of the body which may be called variable,—namely, circulation, secretion, and absorption,—as well as nervous influence, that when figure, position, and magnitude, and their variations, are known, the determination of any given problematical point, either as to the existence or nature of disease, or its degree, or the mode of curing it, may be as remote as ever. It is then sensation and its modifications, motions and mobility, and their variations, irritability, and excitability, and all the multiplied forms of animal and vital action, that claim attention. These are not only themselves liable to considerable irregularities and variations, but they are under the influence of the nervous system, which being liable also to irregularities of a peculiar nature, impart to the others some of these irregularities. Yet the very knowledge of all these circumstances, the business of studying them and understanding them completely, constitutes science, though that science cannot be ranked among those named exact.

Few will doubt that there is such a thing as moral and political science, however much the conduct of individuals and nations may tend to call the existence of such sciences in doubt. Indeed, between seventy and eighty years ago, an eminent philosopher and public teacher wrote a work with the title of Elements of Moral and Political Science; and although the author, in that able performance, maintained a position of most dignified and reverential distance from the practical application and the actual state of moral and political science, yet it is not less certain that there is, abstractly speaking, a series of principles entitled to the name of moral and political science. In the same manner, political economy cannot be called an exact science; yet it is a science, however much the stupidity and presumption of pretenders to the knowledge of that subject may confuse and obscure its principles.

In short, we must maintain that there is in surgery a science or theory, however difficult it may be to show what it is, and however it may be obscured and discredited by empirical, irregular, or nonsensical practical applications, and however much it is disgraced by the actual state of surgical practice in the hands of rash, reckless, and unreasoning men.

Mr Vincent is a great admirer of mathematical science and its applications, dynamics and mechanics; and he consequently very strongly recommends to the cultivation of surgeons these branches of intellectual exertion. It is impossible to doubt that the knowledge of mathematics, and also of mechanical philosophy, may be useful to the surgeon, and that, in the practice of his art, he may often be aided by a correct and extensive knowledge of mechanical principles. At the same time it must be admitted, that applications of mathematical and mechanical principles form not a very considerable part of either the science or the art of surgery; and we are inclined to think that, after all, the benefit derived from the study of geometry and mixed mathematics is the discipline which the mind undergoes, the energy which its faculties acquire, and the promptitude and vigour with which it is thereby enabled to act for itself, in situations which do not admit of delay or much preparation. Nothing so sharpens the faculties, and gives habits of steady attention, as mathematical reasoning; scarcely anything else enables a man to reason so clearly and conclusively, and to disentangle confused and complicated subjects when presented to his mind; and certainly the cultivation of no other science or branch of human inquiry, inspires so firm and high a degree of confidence in its own powers, and their acquirements, as mathematical knowledge. Yet, mathematical reasoning does not avail much in medical and surgical subjects; rather, it is of small avail. The evidence required in the latter is not demonstrative, but only probable; and when mathematical reasoning has been applied to physiological and pathological inquiries, it has invariably turned out worse than useless. The most eminent physicians and surgeons, also, are not those who have been mathematicians. Morton, Sydenham, Freind, and Mead were better physicians than either Borelli, Pitcairn, or Cheyne; and Ratcliffe, who despised all science, was as distinguished and as successful as the best of them. Is it not the fact, also, that at the present time, and for a long time past, the largest incomes have been made by surgeons who cannot tell the difference between a square and a triangle, and are in a state of the most comfortable ignorance as to the relation between the radius and circumference of a circle, and never heard of the difficulty of squaring that simple figure? How, then, can it be expected that young persons in educating themselves, and being educated, for understanding the theory and exercising the practice of surgery, should devote much time or labour to studies apparently so little useful and so unprofitable? When a young man begins the study of surgery as a profession, he considers what branches of knowledge have rendered this surgeon dexterous, and what have made that surgeon skilful, and these he accordingly cultivates, in the hope that he too may become able and eminent. It is quite in vain to deny the general truth of the proposition that no surgeon during the last fifty years, who has been in any degree skilful, dexterous, and renowned, has owed any of these qualities in the slightest degree to the influence of mathematical studies or the possession of mathematical knowledge; and we could name surgeons of the last and the present age, and distinguished surgeons too, who could not demonstrate the simplest theorem in Euclid.

This leads us to observe that Mr Vincent at length, after showing the advantages of mathematical training, and the value of the mathematical intellect, brings out the truth in the following remarks:—

> "The difference observable in the mental capacities does not always depend upon the simple distinctions of the natural endowments, for it also depends upon the artificial means by which they are gradually led to understand mankind itself. All the inducements that the intercourse with the world hold (holds) out as motives for action, have a constant and prevailing influence to encourage the adoption of that character of mind which is best calculated to promote interests; that is, if not of sowing the seed, of encouraging the growth, of the perceptuous or subtle turn of mind, and therefore of choking the very peering of the real intellectual plant. All the incitements to wealth, power, and position, are attractions to cultivate and strengthen the subtle character. And the medical profession being one of competition especially, engages in its service the art best adapted for acquiring public opinion; and thus it is that subtlety is reputed to be talent. This bustling and fretful state does not allow of the quiet and unimposing demeanour which intellect delights in. All the desires and inclinations of the subtle mind are fostered by the imperfect construction of the scheme of actual life, while the aspirations of the intellectual are smothered by the insatiable nature of cupidity." [Then follows a passage from the character of Philip of Macedon, as given by Justin, which, for the benefit of the curious, we translate.] "In him compassion and perfidy were equally beloved. No method of obtaining an object was accounted dishonourable. Equally courteous and insidious

in address, since he promised more than he had any intention of performing; he was artful both when serious and when in jest. Friendships he cultivated according to the advantage which they promised, not the fidelity of the friend. Amidst these qualities was remarkable eloquence, conversation full of shrewdness and depth, so that neither ornament was unattended by ease, nor was the ease of his inventions void of ornament."—Justini Historiæ Philippicæ, Lib. ix. C. viii.

Certainly, Mr Vincent; you are quite right; and it is impossible either to doubt or to deny that knowledge of the world, of mankind, and, above all, of womankind,—a pleasing manner, in which, without any sincerity, every one is made to believe that he is at the time most highly esteemed,—are much more efficient in securing success than either scientific attainments, however accurate, or professional attainments, however sound. Where was it ever known that the most exalted mathematical attainments, the greatest knowledge, and even the most correct professional attainments, procured a surgeon either one patient, or were the means of recommending him to the governors of an hospital? These are not the paths to distinction in the surgical world. To secure the friendship of a few of the governors, to flatter the senior surgeon or surgeons, to make the treasurer believe that he has the talents of a Chancellor of the Exchequer, and the virtues of an archbishop,—these form the most direct means to success in that line. On the other hand, to be either what is called an honest whig or a faithful tory, are the means by which success is to be ensured in other quarters. Without these indispensable requisites, the greatest talents, the most correct knowledge, and a character for the greatest attention, are totally unavailing. Grieved we are to see that Mr Vincent brings out all these valuable mysteries. But the affair is not ours, but his.

The author is perfectly honest and fair in all this whipping and flogging of the profession. Those, he says, who are fully satisfied that scientific surgery is making great advances, should produce the proofs necessary to substantiate the fact, and give the instances of the close connection of science with surgery. It appears to him, that the most part of what is at present taught is rather a series of mere opinions, as they have been successively formed, with continual changes, than a code of scientific principles. We have, he allows, received the benefit of men of talent in bringing new facts to light, but only with the results like those of the artist in his studio, or the manipulator in his museum,—representations of things. We have no display of a master intellect, that has elicited, by the discovery of relations, immutable truths, and combined them into an undivided whole, so as to make a science of surgery. Hunter, whose mind was constituted for accomplishing this work, is admired, but not followed. "I confess," he concludes, "I have been much surprised to find that so many surgeons of high repute in the profession, and whose faculties appear to have been exclusively devoted to surgery, and yet who have not, in their writings, even approached the way that leads to scientific surgery."*

Without stopping to notice the unscientific construction of this sentence, we must observe,—that the conduct of surgical practitioners and the actual practice of the art do not prove the absence or non-existence of science; it merely shows that the attention of these men is devoted more to the art and trade of surgery than to the science,—to the business and means by which money is to be made, than to those by which the science itself is to be improved and established; that in all the inexact sciences, the opinions of practitioners must be received, in some degree, as indicating the practice, and consequently the theory at the time; that certainly this produces an appearance of discordance, inconsistence, and want of uniformity which diminishes and impairs the scientific character of the art; that it must be allowed, that there is a want of generalization and the establishment of those general truths which alone can constitute science; that, nevertheless, such is the state of society, that no attempt to generalize would be of the smallest value, or could effect the slightest good. Indeed, if it were, it would be sure to be rejected and despised as hypothetical, theoretical, fanciful, and every thing bad and useless; while any collection of individual opinions and facts would be sure to be eulogized as the most practical and useful work that had ever appeared; and hence it seems very doubtful whether surgery ever will be a science, even in the modified sense which we have assigned to it.

Every one must agree with Mr Vincent in thinking that fondness for operations is a bad symptom for the state of good surgery. Every one knows that operations are performed in many cases in which they are either unnecessary or injurious. "Even when necessary and admissible," observes Mr Vincent, "they are very often unsuccessful." But it is certainly lamentable, as well as mortifying, to think that often when totally inadmissible, they are recommended to be performed, and are performed. "Surgery as a science," he observes, "would decide many questions in the way of avoiding operations. The surgeon who is too eager for performing operations, is not likely to impart scientific principles to the art."

Certainly the glory of the surgeon and the credit of surgery would be most consulted by the smallest possible number of operations; and it may be very safely doubted, whether dismembering operations, or those of removing parts, are nearly so necessary as has been formerly taught. We think that even in this department there is an improvement, and repeatedly have we directed the attention of our readers to the fact, that operations, such as used to be very frequently performed during the eighteenth century, are now rarely thought of. As surgeons advance in years, we observe that they are less fond of operating. This we ascribe partly to the fact, that they have in the course of experience found that operations do not so frequently accomplish the objects proposed, as had been in their younger days imagined; and that in other instances, diseases which were supposed for their cure to require operation, may be cured without having recourse to that ultimate resource. There is also, it must be allowed, a decided movement to dispense with operations, and to cure by general and local management.

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* This sentence, which violates the rules of correct syntax, should have been constructed in the following manner:—"I confess I have been much surprised to find, that so many surgeons of high repute in the profession, and whose faculties appear to have been exclusively devoted to surgery, yet have not, in their writings, even approached the way that leads to scientific surgery." Or "that," after "find," should be kept out.

On this subject, however, we must not longer dwell, as it is requisite to see what the author has done and proposed to improve surgical practice.

The Observations on some of the parts of Surgical Practice are delivered in one continuous and uninterrupted series, forming a discourse, as it were, which occupies the whole volume after the inquiry. No division or distinction is attempted into chapters or sections according to the subjects; but the observations on one subject follow those on another, without any indication to the reader of what he is to expect. From this method we take the liberty of departing no farther than merely to distinguish each subject treated.

I. *Agency of the Muscles and Muscular action in the Treatment of Fractures and Dislocations.*—Mr Vincent impresses the indispensable necessity of understanding thoroughly the action of muscles, in undertaking the management of fractures and dislocations. Muscles act, he argues, in association; and each group of muscles has a centre of motion around which they act. A proof of this association, he thinks, is found in cramp,—a state produced either by excess or diminution of the amount of exercise to which any given muscle is subjected. If cramp take place in the extensor of a joint, the most prompt and effectual remedy is to throw, if possible, the antagonist muscle into strong action. Thus, if the *extensor pollicis proprius* be affected by cramp, if the *flexor pollicis longus* be made to act by pressing the toes against some substance, all cramp instantly ceases. The *biceps flexor cruris* is also a muscle very liable to cramp; but by bending the leg or the thigh, and rotating the tibia inwards by means of the inner ham-strings, the foot being pressed against some resisting object, the cramp is instantly removed. Rubbing a cramped muscle rather adds to the suffering ; and approximating the attachments, or, what is called relaxing the muscles, has no effect at all.

He states three laws regarding muscular action.

The first law is that of association, by virtue of which a number of muscles act in unison and harmony, either in keeping a bone at rest in a fixed position, or in moving it in a particular direction. All the muscles around any large joint act together in producing certain movements of the bones on each other. Scarcely one muscle acts alone ; very seldom two. But all are more or less associated in that general action, which produces in the animal body those complicated and vigorous motions which are so wonderful.

All muscles are, for the most part, exercised in the forward movements of the body, and as very few people have much use of the muscles that act in a sideway motion, so, when any one muscle is used in this forward motion, many others are, by reason of the association of actions, called into motion, to the injury probably of the case under treatment. By placing the patient on the side, owing to the disuse of the muscles calculated for this kind of movement, the whole system of muscular actions is more likely to be in repose, and has less chance of being excited by the laws of association.

Secondly, The relaxation of muscles is to be effected by attending to their position, when they are required to throw out their strongest exertions ; and not, as is usually supposed, by approximating their attachments. A good example of the effect and application of this law is afforded by fracture of the humerus, immediately below the attachment of the deltoid muscle. During the first days after the occurrence of this accident, owing to the disturbance which the absence of the integrity of the bone gives to all the muscles engaged in moving it, the deltoid raises the upper portion, and gives the limb a great appearance of deformity, while it threatens to counteract the aim of the surgeon in obtaining straight union. This will in truth be the result, if he brings the lower portion away from the side of the chest, to meet in apposition the upper projecting part. Instead of doing this, he has only to take measures that the lower end may hang easily by the side of the patient, and he will find the upper portion fall into the straightest position he could possibly desire. When the upper portion is hanging by the side of the chest, the deltoid is then in a state of the smallest possible action. In this way of reasoning, Mr Vincent finds that this fracture unites in a remarkably straight form.

The third law regulating muscular movement is the following. When the usual direction of action of a muscle about a centre is changed, that muscle exerts a degree of strength which seems overpowering. This is exemplified by the case of dislocation of the patella on its edge. When the patella is displaced in this way, it throws into most violent action all the extensors of the leg. Their force is the effect, first, of that irritation which all muscles receive, when they are thrown out of their ordinary line of action, particularly when they are disturbed in moving round their ordinary axis or centre of motion; and, secondly, because when these muscles are called upon, they act most powerfully; in other words, they are in the strongest action when the limb is to be straightened, as they are then to balance and support the whole weight of the body, by making a firm pillar of the extremity. In this condition these muscles act with a power that defies all the force that human aid can call into its service. If, however, the leg be inflected a little, all this powerful opposition to restoring the patella ceases upon using the slightest rotatory motion; and the bone readily falls into its place.

After adverting shortly to the influence of habit, he next adverts to that power which, in the human body, can set aside the ordinary laws of matter. The laws of hydraulics, he observes, little influence the circulation; and he seems to think that the laws of mechanics little influence the actions and motions in the human body. Among other proofs he informs the reader, that the best way, in which a patient gets rid of a body that has passed into the trachea, is not by hanging with his head downwards, but by sitting up, as all people do, when they have to expectorate mucus. If the body, he adds, is moveable, it may certainly be placed in that condition for a speedy relief of it, without the occasion of opening into the patient's trachea.

This seems something like urging principles to an undue extreme. Doubtless the ordinary laws of matter are often in the human body controlled and suspended. Yet it cannot, therefore, be justly said, that they never operate in the human body, or are never allowed to operate. In the case adduced of a foreign body slipping into the trachea, we believe, that in considering the most probable easy means of effecting its expulsion, it is necessary to bear in mind its mechanical properties; its weight, its configuration, its being provided with sharp angles, or having a rounded blunt surface and margins. In the case of Sir J. Brunell, in which it was stated, that one eminent surgeon proposed to suspend the patient with his head downwards, in order to expedite the expulsion of the coin, we believe, it must be allowed, that the weight of the body, namely a half sovereign, and the absence of angles, gave reasonable hope that this might have been successful. It was fortunate, however, that the coin was ejected in the ordinary way, and that the measure of dependent suspension as well as that of tracheotomy was superseded.

Dislocation, or luxation, the author ascribes to the action of muscles, that is, he regards it as a displacement by the application of force, so as to give an irregular centre or axis of motion to the bone, and thereby place it in such a position, that the muscles pull it out of the socket. The muscles have a similar share in the reduction of the bone to its normal position.

The general principles and features of this accident, as well as the proper treatment, Mr Vincent illustrates by referring to the case of dislocation of the humerus. These it is needless to repeat. He is desirous, however, to correct a notion which surgeons seem to entertain, that, when powerful traction or extension is made on a luxated limb, the direction of the traction may be changed by making forcible pressure at right angles to it, so as to lift, as they call it, the head into the socket. The laws of motion show, he adds, that this cannot be done, except by a power little less than that laid upon the line of traction (extension). "I have often seen," he says, "this lifting of the bone attempted, but only to prove the impossibility of accomplishing it." The author properly observes, that the surgeon cannot be said to effect the reduction. His efforts are limited to that of drawing the bone so near the glenoid cavity as to bring the muscles into a situation to remove that association in which all these actions have been accustomed to take place; in other words, in which they all concur to draw the bone into its normal position and retain it there.

Now, the information given by the excellent author as to surgeons attempting to lift the bone into its socket, is to us new; and if it be the fact, which we are bound to admit, it shows that surgery is in a much lower condition in the latitude of Mr Vincent, than we imagined it to be. What is taught at present or formerly by the anatomists and surgeons of the metropolis, as to the mechanism of luxation, we know not. But we always understood that the great object in reduction was to bring the bone first gently out of its unnatural position, and, secondly, to place the articular head in such relation to the articular socket, that the muscles might themselves replace the bone.

The numerous cases of this kind that are brought to St Bartholomew's Hospital are, for the most part, reduced by means of the heel in the axilla, which, indeed, applies the traction or extension in the best direction, outwards and downwards, inasmuch as, while the limb is drawn downwards, the foot pushes the head outwards, and then the extension is oblique in its direction; while the foot, by pressing on the inferior costa of the scapula, fixes this bone tolerably well. We should doubt much whether the foot really pushes the head of the bone outwards. But it has the effect of making both a degree of counter-extension, by pushing the chest and the scapula back in the direction opposite to that in which the extension is made, and it enables the surgeon to act with greater force on the humerus while he makes extension.

" This observation leads to the subject of long-standing luxations. Some years ago, a patient was brought from the country into St Bartholomew's Hospital, who had a dislocation of the thigh of some weeks' duration. The first surgeon who saw him had not detected the luxation. After some weeks a second surgeon saw him, and at once knew what had happened. He adopted the usual means for reduction without success. The patient was then, at the end of six weeks, sent to London. I adopted the usual plan of extension from a fixed point, and readily brought the head to the natural range of the joint; but no contrivance could shoot the head of the femur into the acetabulum. I was not contented with one trial; I failed in at least three. This occurrence led me to reflect on the principles on which the treatment of dislocations rests. I am now convinced, that in recent luxations, there is a power independent of the operator, which can, in spite of the force he employs, and in opposition to the direction of it, thrust the bone into its place; so that it is really the absence of this power of muscles that is the reason why old luxations of this sort are not reduced in the way the operation is usually conducted."—P. 26.

" A case presented itself to me, in which the humerus had been luxated seven weeks, extension was conducted in the usual way for a long time, and with the fullest force, and no reduction resulted. I then drew the limb across the chest obliquely, and by this means returned the head of the bone into the glenoid cavity with very little effort. A maid-servant fell down stairs and injured her shoulder; a practitioner living near was sent for, who was not aware it was a luxation. The mistress sent her to me at the end of six weeks; I saw the nature of the case, and took her to the hospital. I first tried the usual plan in vain; I then placed a thick body just in front of the axilla; and by first drawing the arm down, and then carrying it across the chest over the body, the bone slipped easily into its place. The perfect use of the limb was ultimately recovered. Thus it is not by the force of extension, but by the adaptation of appropriate manipulation, that old cases are to be reduced. The bone is easily replaced, and as easily put out again, so that a long observance of immobility must be insisted upon after the reduction, before the limb will become quite restored. Of course there is a limitation to the period of the propriety of trying reduction in old cases, as the power of accommodation is so unfailing, that changes too great may occur, after much time, to justify the interfering with this settled order of things.

" I consider that it is highly proper for the security of the joint, that the limb, after a luxation, should be kept at rest some weeks. A brewer's man was brought to St Bartholomew's Hospital, with a luxation at one hip and at one shoulder. He was kept in bed a month after the reduction, but allowed to move his arm. When he left, he felt nothing of the hip, but he suffered pain in his shoulder. A female, of the order of fishwomen, was brought to the hospital with dislocation of the shoulder; the bone was reduced, and she chose to go out, and immediately resume her occupation of carrying a basket on her head. The dislocation very soon recurred, and again and again she applied at the hospital for the same purpose, it slipped out so readily. But as the old method of mere traction was employed, it became more difficult to effect the reduction, so much so, that at last she had to stay in the hospital some days before it could be accomplished."—Pp. 27, 28.

In forming a diagnosis, the author attaches great importance to the increase of length between the acromion and the external condyle of the humerus; and he gives two cases in which the accurate measurement of this space, showing it to be longer than in the sound state, led him to regard the humerus as luxated in the axilla.

He places little reliance on constitutional means, for inducing relaxation of the muscles, as blood-letting, and tartarized antimony given, so as to nauseate and induce sickness. These means, as well as the warm-bath, have been in his practice unavailing, and he therefore decides against their employment.

Fractures taking place in aged persons in the glenoid cavity or at the neck of the scapula, the occurrence of which some surgeons have denied, he allows may happen from falls. These generally do well by merely enjoining rest and the observance of proper position.

Fractures of the anatomical neck of the humerus, which always occur in young subjects, he considers as cases of separation of the epiphysis. When the arm is resting quietly at the side of the patient, the only muscles likely to be in moderate action are the four muscles inserted into the tuberosities of the humerus; and they probably cause the alteration which is observed on union of the fracture, which is, that these processes are brought higher and a little more forward than usual. This causes slight shortening of the arm; but the limb is restored to as useful a state as the other arm.

Separation of the epiphysis of the lower end of the humerus from the shaft is not uncommon; and is liable to be mistaken for dislocation, which it simulates. It is easily distinguished by keeping the attention fixed to the radial joint with the humerus.

Separation of the condyles, also, the author has often seen in children. One condyle may be detached, while the other remains fixed. The radial part of the joint is here also of great service in forming the diagnosis, when the condyle is separated. In all these cases the principle of treatment is the same,—to place the limb in a state of perfect quietude.

The first phalanx has not a strictly ginglymoid or hinge-like connection with the metacarpal bones; and hence displacements of any of these bones require some peculiar attentions. Some years ago, a patient was brought to St Bartholomew's with a luxation of the first phalanx of the second toe upon the metatarsal bone. A long and painful extension had been made without any impression upon the displaced bone. Mr Vincent bent this phalanx at right angles to the other bone, and with one finger pressed the projecting end downwards, and then made the other end revolve, so as to make a straight line with the fixed bone. The reduction was easily effected without pain. The author was standing in the quadrangle of the hospital, when he saw a student fall upon one hand. The last phalanx of the thumb was dislocated, the bone lying in the dorsum of the other phalanx. He brought the luxated bone down at right angles over the other, and pushing it at the same time towards the palm, while he extended it lengthwise, he reduced it with ease and without pain.

In the management of luxations and fractures of the collar-bone, he avoids the use of bandages, and merely places the patient on his back on a firm flat bed, preventing him from using the arms.

In dislocation of the lower jaw, the great point in effecting reduction is fixing the head in a steady position, so as to ensure counter-extension or rather fixation. The head should be placed firmly against the wall; and the direction of the force should be to move the bone about its own regular axis; that is, to press the condyle downwards and backwards, at the same time that the angle is brought forwards.

In fractures of this bone, which are not uncommon, it is important to remember that the bone is highly organized, and therefore its powers of reparation are great. It unites quickly, and deformities left are often speedily removed. In nekrosis, also, it readily exfoliates. The most usual spot for fracture to take place is at one of the *cuspidati* teeth, as at this point the jaw is weaker than elsewhere, owing to the tooth sinking deep into the jaw. In consequence of the attachment of the muscles for shutting and opening the jaw respectively, if the head be kept up and the jaws closed, a constant effort is made in swallowing to separate the portions of the fractured bone. He has seen many contrivances for keeping the parts in coaptation, some having all the merit of thumb-screws for producing pain; but all were perfectly worthless for the purpose for which they were designed. No good is accomplished by any bandage. The obvious method is to keep the patient's chin upon the chest, when the muscles will become passive, and will then, in the smallest possible way, displace the bones. The bed is the proper position to carry out this measure.

The only form of fracture in which Mr Vincent allows the use of the bandage is that of fracture of the true ribs, with or without fracture of the sternum. The reason is, that, in inspiration, when the whole ribs are drawn upwards and pressed outwards, the parts of the ribs are displaced, and then the fracture is most readily discovered. The use of the bandage is to prevent this displacement. When emphysema occurs, he dissuades from making incisions to allow the air to escape, as the air is easily absorbed, and disappears as soon as effusion ceases. The bandage is useful in this case also, by confining the air within the cavity of the pleura. The great use of the bandage appears to us to be, that while the patient makes an instinctive effort to keep the ribs motionless, and breathes by the diaphragm and abdominal muscles, he does so more easily by means of the support and resistance which the bandage affords, than without that assistance. In fractures of the false ribs the bandage should not be used, as it generally increases the sufferings of the patient.

It has been usually assigned as a reason for the neck of the thigh-bone being easily broken in old age, that this part assumes with the shaft of the bone an angle less oblique than in earlier age. This reason he rejects as altogether at variance with mechanical principles. The true explanation of the ready and frequent occurrence of the accident at that time of life is to be found in the diminution or total loss of that preserving power, which arises from the combined and associated action of those muscles which surround the joint. In age the individual becomes infirm in those movements to which he had all his life been accustomed, especially in the power of balancing. In every fall, that is, in every accident attended with subversion of the centre of gravity, the muscles naturally and instinctly make efforts to lighten the force, with which the body comes to the ground, and often succeed. Sometimes even this action of the muscles may entirely prevent a fall. But in the infirm and the aged none of this counteracting power exists or operates. The individual comes to the ground like a dead weight or any mass of inanimate matter. Alarm and panic have often the same paralysing effect. The boy who falls frightened from the cherry-tree breaks his thigh; the elderly female slipping on the ground, or rudely pushed, breaks some part of the thigh-bone. In general, in the aged, in whom this accident so frequently takes place, the individual has come to the ground, striking the trochanter, so that the whole weight of the body is thrown on that point.

It is well known how much surgeons have varied in opinion as to the best mode of managing this fracture. At one time, the long splint of Desault was all the fashion. Then came the long splint used at St George's Hospital, which was in fact a modification of that of Desault. Mr Vincent is opposed to all apparatus of splint and bandage of every kind; indeed, to every thing implying pressure,—because, in employing such means, we should be baffled by that state which age usually brings with it, namely, the defect in the powers to endure long and continued pressure, and because all such means must rather promote than prevent the derangement. Instead, therefore, of placing the patient on the back with the long splint, he places him on the side without any splint at all. He states that he has treated patients by this method; and the cases have turned out much better, in restoring the powers of the limb, than when treated according to the plan usually adopted. He allows, nevertheless, that the fact is, that the age of the subjects of this accident compels the surgeon to adopt the position on the back, and the inclined plane, as it is only in this way that the functions of life, in the advanced stages, can be even tolerably well carried on. On the back also, pressure is much less likely to occasion sloughing than if the patient were laid on the side.

In speaking of dislocation of the hip-joint, he applies the same principles as were explained in speaking of that of the shoulder-joint. Extension is of use; and fixation or counter-extension is important. But the power of the muscles properly directed, is the great agent of reduction. "The ordinary manipulation of the surgeon goes no farther than to bring the displaced bone into a position in which the muscles around the joint may resume their associated actions; and then they start, with velocity and power, the bone into the socket." This power, exerted by the muscles, is of course called into action by all attempts at extension, and it is exerted very much as the traction of extension is directly or obliquely opposed to it.

> "It is properly directed to conduct the traction slowly and steadily, not by jerks; this is quite reasonable. The extra-position of the bone is the excitement to the muscles to oppose; and just in proportion as the bone is brought back to the position in which their natural association becomes perfect, so do they cease to act in opposition. In placing a finger on the trochanter, I have found that the rate at which it moves increases as it descends. The facility with which the associated muscles may take on this office of assisting the reduction, must of course vary with the integrity of the muscles themselves, for some may be torn from their attachments. I have already stated a case of old dislocation, which I think I should have reduced, had I at the time of treating it been aware of principles I now understand; and even in recent cases surgeons should know that they have more expedients than merely making extension, such as the changing occasionally the line of direction of the extending power."—P. 56.

The extension or traction, the author maintains, should not be from one fixed point, either in old or recent luxations; but in such way that the direction may be changed, so that, if the joint be the centre, the extremity of the drawing power may move in all directions. In old cases he recommends that the traction admit of change in its direction, and that, while the bone is being drawn down, it should be carried across the body, while the limb is gently everted, by which reduction will probably be completed. The author has had no opportunity of putting the plan in execution in old luxations of the femur.

On the utility of the inclined plane in the treatment of fractures of the femur, Mr Vincent delivers the following remarks:—

> " Surgeons impute to the inclined plane circumstances which do not belong to it. It does not entirely support the leg when it rests upon it, and this degree of support diminishes as the angle of elevation increases; and further, as the thickness of the calf of the leg prevents the whole of the lower part of the broken thigh resting upon the face of the plane, this part overhangs as a lever, and allows the leg to act as a weight, drawing down the knee and elevating the broken bone at the place where it is fractured. The action of the sartorius, which cannot be prevented in the position on the back, must have also some influence in giving the form which the bone always assumes, when united under this management, of bowing outwards and forwards. By the treatment on the side position, these defects are in a great measure prevented. It is to be observed that to carry out effectually the advantages of this last method, the trochanter major, the external condyle, and the external malleolus, should be accurately placed in the same plane, and the hips should be kept the one vertically over the other."—Pp. 61, 62.

After injuries of the joints, as contusions of the parts forming them, fractures affecting the bones of which they consist, and luxations, it is not uncommon for great stiffness to affect them so as to prevent free and easy action; and, with the view of restoring mobility under these circumstances, numerous methods, mostly of a mechanical nature, and some sufficiently rude, are recommended. Against all this system of interference with nature, Mr Vincent is a decided opponent. The joint must be left, he maintains, to the conservative or restorative powers of the system, which will in general accomplish what is desired; and if these do not, no surgeon or surgical contrivances and devices ever will, he gives us to understand.

> " A young lady of about seven years of age, playing in the garden, fell on her elbow; she felt little of it, but it produced a slight enlargement; her mother showed it to the family medical man; he finding it stiff, and a little swelled, advised it to be freely moved. It got worse, and she was brought to me. It was just that slight injury which so usually sets up scrofulous disease; there was con-

siderable enlargement about the joint and pain on motion. The chief treatment was perfect rest and mild counter-irritants. It immediately got better, and in the course of two or three months was quite well. A gentleman that I attended with a fracture of the olecranon, after having gone on very well, so that at a proper time I was enabled to say the fracture was united, found that the joint remained very stiff. This he thought ought not to be; and he went about to inquire the best way to make a stiff joint movable: all sorts of propositions were submitted to his choice, from sawing fire-wood to being one in ringing a peal of bells. These mechanical operations rather made him worse than better, so that he yielded to my advice, and kept the limb quiet, by which, in a very short time, it was quite as movable as the other arm."—P. 64.

Of separation of the attachment of the *rectus* and *crureus* from the patella the following example is given:—

"A gentleman was walking up some steps, when he found he was falling backwards. The muscles most interested in preserving the balance of the body made a sudden exertion, and he felt something give way at one knee, and he fell. He contrived to get upon his legs; and in making an exertion to balance himself, he felt the same sort of snap in the other knee, and he again fell. He was brought home, and sent for me. I readily assured myself that the rectus and crureus were detached from each patella. The bone was entire, and there was a vacuity above the upper edge of the patella, which might lodge in the depression two fingers by breadth. There was a good deal of swelling around the joint. I treated it precisely in the way I have above described for the fracture of the patella, avoiding all bandaging, and relying upon the efficacy of the power of conservancy for carrying on the reparation. In a very short time, a medium was formed, filling up the vacuity, and simultaneously the muscles became approximated to the patella: in the course of about six weeks the attachments seemed to have become as perfect as they would have been in the unhurt state, as far as the examination could make out,—a result gratifying both to the patient and the surgeon. He was very soon able to walk across his room, and when I saw him a few months after, he told me he could walk nearly as well as ever, without the aid of a stick. In this case I presume no surgeon would have put on a bandage, as this could only serve to tilt up the patella, and obstruct the coming down of the muscles to their proper attachments. Long before this case occurred, I had another of the same kind in one knee, in which bandages were used. The recovery was slow and imperfect, as the patient could not do without a stick for some years, and the limb remained always weak."—Pp. 71, 72.

In all these examples of displacement of the patella, the mildest measures are recommended; and the surgeon is advised always to consider how he can best either get the muscles to exert themselves in effecting his object, or at least to be passive.

Under the same head, Mr Vincent speaks of luxation or displacement of the semilunar cartilages; and he is here equally decided against the use of force. Sometimes the cartilage returns to its place when the patient is asleep; sometimes when nothing is done for it. Of course, the best way of favouring this is for the patient himself to place his limb and joint in the easiest possible position, and trust to the conservative power.

In the treatment of fractures of the leg, if the bones have been properly set, and placed in coaptation, he in general allows the patient, indeed advises him, to try to walk at the end of three weeks. In so doing he dissuades from the use of crutches, which, he properly observes, require a peculiar sort of education in order to use them conveniently and safely; and when the patient has acquired this faculty, he in general no longer requires them.

The author has often had under his care with fractured legs females in a state of pregnancy; but he has not observed any difference in the progress towards union.

II. *Irritability of the System, or resistance to Irritants evinced by the phenomena taking place in the mucous surfaces.*—A portion of an ear of barley slips into the nostrils, with the stalk end foremost. The least touch of a body so formed, in such a situation, thrusts it further inward. For one or two days it produces considerable irritation, which, however, at length subsides; and the foreign body, coated with thick mucus, is ejected without effort. A small piece of leaf of a vegetable gets into the ventricle of the glottis; and causes great irritation and coughing for some hours. It is soon enveloped in mucus, and comes quietly away next day.

These facts show what the surgeon should do under similar circumstances. He should not with his forceps irritate still more parts already too much irritated. He is not to allow even any effort of sneezing, in the one case, or unnecessary hawking, in the other. He is to require the patient to be kept quiet, that the body may continue in one situation, so as to acquire as soon as possible the coating which facilitates its ejection.

It has never happened to Mr Vincent to have a case of foreign body in the trachea. But should such a case come under his management, he states that he should not think of making an opening into the trachea, providing the body moved freely up and down within the tube. He would even reverse the present practic both in this and similar cases. He would keep the patient as quiet as possible in bed or on a sofa; advising him to avoid all effort to expectorate; and he doubts not that very soon the foreign body would be ejected.

The rule seems, on the whole, not liable to objection, if the condition specified,—the mobility of the body within the trachea,—be kept in mind. When the body is fixed or detained in any way, it causes inflammation and ulceration of the air tubes; and sometimes the results are fatal. Yet even when it has caused ulceration for some time, it has happened that such a body has been at length ejected, sometimes with recovery of the patient, sometimes causing death from the injury done to the *bronchi* and lungs. Such is, among others, the case of a piece of ivory which had penetrated the lungs, given in the Medical Intelligence.

> "The practice of surgery presents to us the resources of nature of ridding parts of the presence of extraneous bodies by the means of the stimulus of relief. In cases of hemorrhage the surgeon plugs the nostrils. The efficacy of the operation depends upon the lint he uses being tightly pressed into the posterior nostrils. So it remains for a few days, and then if the surgeon withdraws it, he finds it free from all stricture; indeed, so loose, that it will, perhaps, discharge itself into the pharynx. The bulk of the wadding is the same as when tightly introduced; and so far from having lost any of its parts, it has acquired an addition in the thick mucus with which it is saturated. The fact is, that under the influence of the stimulus of relief, the internal nares have been quietly enlarged. A child was brought to St Bartholomew's Hospital with a pebble in the meatus of the ear. I found it of an oblong form, and firmly wedged in. I could get the blades of a small pair of forceps to grasp it when passed over the short diameter, but I could not make it stir. Having the fear before me of doing mischief by using force, I directed the mother to bring the child in a fortnight. She did so, and I found the pebble quite loose, so that it might be removed by only a shake of the head. The body was coated with cerumen, and of course interstitial absorption had been going on under the influence of the power of relief setting it free."—Pp. 95, 96.

In the following passage, the author gives evidence that many surgeons must be mere machines, and, if they have intellects, never exert these useful faculties:—

> "In the case of fistula in ano, after the operation the surgeon inserts a piece of lint to prevent the parts divided from healing by adhesion, as the edges of the cut are compressed together. This is quite right. He goes on inserting the lint, which produces a very slight irritation, and he soon finds that the lint does not remain in the gap, but comes out and lies upon the external parts. He may doubt whether, as the lint does not remain, it really does any good. But he should regard this as a proof that there is a powerful exertion for healing going on; and if it is thrown off in a few hours, so much more may he be assured that the process of repair is more fully carried on."—Pp. 96, 97.

III. Next follow observations on the necessity of attending to the state of the constitution, and what may be termed constitutional reaction under injuries, and their effects; the necessity of repose in bed in the treatment of many disorders; the facility with which some patients, after a few days, become reconciled to this; and the accuracy with which all the functions, especially that of digestion, proceed; the necessity of supporting the system by nutritious food, and occasionally by stimuli; and the question of employing evacuants or tonics, opiates, and antispasmodics. He then enters on the subject of traumatic gangrene, for which, he tells us, he would not amputate. He informs us, that, by the observance of the principles enunciated, namely, watching the patient carefully, and administering food, if the stomach can retain and assimilate it, and stimuli if requisite, and where this is impossible, waiting for the instant when it becomes so, he has never had a case of traumatic gangrene arising from severe injury that has not stopped. "I am convinced," he says, "that by adopting this course, of watching the expressions which the constitution shows during the first three or four days of the first stage of very serious injuries, and by throwing in brandy, when the indications demand it, that there can be no occasion to amputate on account of traumatic gangrene."

The cases which M. Larrey represents to have been saved by amputation, were actually rescued from death by the administration of brandy. This liquor, in fact, he regards as the great resource for sustaining the action of the heart in these circumstances, and beyond all comparison the best means. Some years ago, he states that he tried the comparative efficacy of brandy and ammonia; and the superiority of the former was marked and distinct. Ammonia, he thinks, impairs the action of the stomach more than any other agent. This impairment is the very thing to be avoided; and what is required, is to make the functions of the stomach and the circulating system go on with some degree of energy, till, in the struggle between the disease and the constitution, the latter shall get the superiority. Ammonia also impairs the secretions, and in so doing causes great evil. To maintain them in such circumstances, Mr Vincent recommends the use of mild preparations of mercury with antimony. At all times where the secretions are bad, it is necessary to keep up regular evacuations, which he maintains not to be weakening, according to the recent doctrines of some speculative innovators, but which he knows to be necessary actions for preserving health.

Besides injuries which are followed by gangrene, others take place, which, though not threatening that termination, assume a character sufficiently formidable. Among this order of injuries the author mentions that of extensive contusion of the muscles of the thigh, with hemorrhage beneath the fascia from veins principally, but probably also from arteries. In this case, as the effused blood tends to stop the hemorrhage, he leaves the duty of removal, first, to the absorbents, and, if they prove inadequate to the task, he, in the course of one or two days, divides the fascia, scoops out the effused blood, and after the cavity suppurates all proceeds well, and the patient perfectly recovers.

Contusions and lacerations of the white fibrous textures and compound fractures next occupy attention. The former every practical surgeon knows to be replete with danger, because they very often give rise to acute spreading gangrene. The latter have always been a source of anxiety to the surgeon, because, in proportion to the degree of comminution of the bone or bones, is the danger of gangrene, or tedious and extensive suppuration, under which the patient often sinks. "When I entered the profession, they were always cases of the greatest anxiety not only for the safety of the limb, but also for the life of the patient, usually with bad results; but now, when once the series of actions is brought into a satisfactory and orderly train, the result may be generally anticipated to be favourable."

The great difficulty is to place the series of actions in this satisfactory and orderly train; and numerous impediments often stand in the way of so doing. First, the injury may be most extensive, severe, and involving so many parts, that to save life, or even the limb, may be impossible. Then patients are often brought, either in a state of intoxication, or in that condition of spirituous impregnation of the whole system, which renders them an easy prey to *delirium tremens.* In the third place, it often happens that in such patients as are the subjects of these injuries, the liver or the kidneys, or both, are more or less diseased, or the lungs may be not quite healthy, or even latent disease may have affected the heart. If either of these preliminary conditions have been established in the system of a patient, they evince their influence by giving to the symptoms a bad and unfavourable character. The stomach, that has long been accustomed to the stimulus of spirituous liquors, and the blood and blood-vessels which receive these poisonous articles, quickly show, when the system is under the influence of shock from injury, their utter inability to struggle against the new destructive action recently established. In the same manner, when, in an individual in whom the liver and kidneys are only imperfectly performing their respective functions, a new cause of disorder is suddenly commenced, that individual is exactly as if he had neither liver nor kidneys; the secretions of both organs are greatly perverted or suspended; no good action, either in the way of suppuration, granulation, or re-union, is established; and the patient sinks under the combined influence of internal disease, or the *inertia* of various internal organs, and the effects of external injury.

In compound fractures, Mr Vincent is decidedly in favour of the bent position and the lateral posture, if the situation of the wound allow the limb to be so placed. All change of position should then be avoided, as any attempt at disturbing the parts in their efforts to recover from the injury they have received, acts on the system in a most detrimental manner. He recommends even that the surgeon should not busy himself about the unsatisfactory arrangement of the bones, whether in the crookedness, or the twisting of them. The safety of the limb and the preservation of the life of the patient are of infinitely more importance than his having an unsightly limb; and every less evil must yield to the most probable means of preservation.

He further recommends that the surgeon should watch most assiduously the general symptoms of the patient; and, looking especially to the pulse, be prompt in administering stimuli if, as the hours advance, the circulation does not rise to what is called sympathetic (symptomatic) fever. Whether this state be established or not, the secretions must be sedulously watched, and brought by all available means to as perfect or health-like a state as possible. When the suppurative stage is established, then the limb may be examined, and, if need be, readjusted, with comparative impunity, yet not without attention to the effects of the changes that have been going on. Every attempt to disturb the position of a compound fracture incurs the hazard not only of aggravating the constitutional symptoms, but of deranging and subverting the local processes tending to reparation and re-union. In a case of compound dislocation of the ankle-joint, in which rose had supervened, the internal *malleolus* became denuded and nekrosed from the loss of its periosteum. A proposition to remove this portion by the saw was adopted. Great general disturbance followed, and death carried off the patient. The case was previously doing exceedingly well.

We have no wish to be severe or uncharitable in forming a judgment; nor to be censorious in expressing such judgment. Nor, indeed, is it possible to use harsher terms than the simple statement of the facts now mentioned. But we thought it had been established in surgical pathology, that the living bone and parts are always adequate to remove the dead; and that any attempt at forcible or instrumental removal of the latter was always hurtful and dangerous. We are happy to see, that in a subsequent page(131), the author expresses a decided opinion on the ignorance and folly implied in the practice of sawing off dead bones in compound fractures.

The approach of gangrene, which is a possible and not unfrequent result in such cases, is known by various symptoms. First comes irregular action of the heart; the pulse rises not as it should do; the artery gives a weak, fluttering, and uncertain beat. The tongue is coated; the expression of the countenance is agitated; the eye glaring and turbid; the patient complains too little considering his state; he is incoherent, and probably starts in his sleep. The wound is dry and hot; and the surrounding parts assume an ashen colour, with the feeling of puffiness around. These he regards as indicating the time for administering brandy.

To show that, in the case of severe injuries of the joints, the result is by no means proportionate to the extent and degree of the mischief produced, the following case is given :—

> " A carpenter, at work on the roof of a house, fell to the ground, on his knee chiefly. He was brought to the hospital, and I found that the integuments of the knee were torn off, and the patella was broken in several pieces, of which some were removed, so that the joint was completely laid open. I decided to preserve the limb. He went through all the disturbances, both local and general, for the first few days, when, suppuration being established, all the derangements subsided, and the parts quietly continued in the regular course of reparation till the wound was quite well; and, except the privation of the motion of the joint, he had a very good limb. This case must incite us to meditate on those circumstances in which the safety of such a case may differ from those miserable results which mere punctures particularly produce in the same part."—Pp. 133, 134.

Compound fractures into the elbow-joint he has found less formidable than the same, that is, analogous, injuries in the lower extremities. Much, we believe, depends on the degree of violence sustained by the parts, and the consequent laceration. The few cases of compound luxation of this joint which we have witnessed have all terminated fatally.

IV. *Influence of the Periosteum in repairing injuries of bones, and in causing their diseased states* (137–148). Here we believe it will be best to let Mr Vincent speak in his own language :—

> " The film-like membrane, the periosteum in its natural state, appearing to be of low organisation,—so low in sensation that it hardly shows signs of feeling in amputation, when the stimulus for repair is brought into full operation by the subsiding of all derangements into the orderly course of new functions,—is then endowed with the power of passing into one of the most exquisitely organised structures of the body. It is then highly vascular, and acutely sensitive, and fleshy in its substance. It is now abounding with life, and full of activity for the purpose for which it has passed into this state. When the surgeon is thus aided by this astonishing

machinery, he is imperatively called upon to do all he can to keep up its productive energy, and he is to do nothing that can interfere with the healthful process. But how few are there who view with tenderness the quiet but effective operations that are going on! How many cases are spoiled by restless interference!

"The cases of diseased bone which present at the hospital are very numerous. It is possible to assign conditions in the state of the parts that may lead to a clear distinction into classes. But, probably, necrosis is essentially an affection of the periosteum in its various changes, and in the result of those changes upon the bones. The influence which seems to me to have the greatest sway in causing periostitis, is cold and wet, when the parts over bones are exposed to these impressions.

"A gentleman built for himself a large house, and constructed a bath next to his study. His delight was to bathe, even in cold weather. The room was not secured from draughts; and one day, in cold weather, he sensibly felt, whilst uncovered and wet, the blast pass over his right shoulder. He suffered most acute pain in the upper part of the humerus, with general swelling of the limb, and still greater pain when the deeper parts were pressed. He soon came to his house in London, and ultimately recovered, even without the formation of abscess; but the thickening of the periosteum, which was left when the general swelling was removed, certified the nature of the attack.

"An elderly lady seated herself in a garden chair after rain; afterwards she felt great pain in the seat. Some months after, I saw her, and found a sinus, and at the bottom a small piece of necrosed bone of the ischium.

"I have been able to trace the attack very often, in the children of the peasantry, to their lying about in wet grass. The attack is always that of acute inflammation, but varying much in degree; and the constitutional symptoms are often very severe,—so much so, as often to make the nature of the complaint doubtful. The course of the very acute form is to pass on to suppuration, and the pus may be formed under the periosteum, but also sometimes in the interspaces of the muscles, and of course always under the fascia.

"I am not able to decide whether the very acute attack is that which terminates most readily in the healthy functions of reparation. At all events, there are two states of periostitis, changing the condition of the bone in two ways: the one where the whole energy of the periosteum is called forth, where the increased action subsides into a transitional state of the membrane, so that it assumes the greatest display of formative capabilities, by which it executes, unerringly and promptly, its conservative protection to the limb. The beauty and the efficacy of its accomplishment must strike all with admiration. This is that state which has the name of necrosis properly applied to it. The original bone is dead, and the periosteum commences its new function of supplying an equivalent by inclosing the dead with a living case, which is to be at once a new and perfect bone, as well as an immediate substitute. The rapidity of this formation is proved by the almost sudden shifting of the attachment of the muscles. The bulky muscles of the limb, which at one moment are attached to the old bone, are at another connected with the new structure, and not the smallest interval is known to pass of their being unattached to either. The muscles suffer no moment to elapse in which they cannot move and support the limb. All their insertions remain in perfect order and integrity.

"This is that state of necrosis where every provision is made for the ultimate state of perfection of the limb. The wall is quickly strong enough to sustain the weight of the body. In its construction, in order to guard against that very overcoming pain, which only one drop of matter pent up in bone produces, openings are left in the walls, and also in the integuments, for the escape of it. With the aid of such effectual powers of reparation, the sequestrum goes on to be detached. All this may require a lengthened time to be perfected. Notwithstanding the vigorous proceedings going on for the safety of the limb, injudicious surgery will often spoil the happy work that is advancing. I have often seen an operation executed which has done nothing but give the greatest pain to the devoted patient, and loss of blood produced in cutting through the periosteum. I am clear that it is quite futile to attempt any operation, except the sequestrum be quite detached; for if the least part be still connected with the living bone, this keeps up nearly as much irritation as the whole sequestrum.

"But the persisting powers of reparation do not terminate in detaching the sequestrum from the living parts; they carry on the work to eject it from its case. In speaking of the cloacæ, I might have said that it would be expected that these should be found at those parts where the muscles are not attached. The same provision is observed in the skull, if matter form slowly upon the *dura mater;* in venereal necrosis especially, the bone is perforated by many openings, so that the patient suffers none of those evils that occur in accidents of this part, where the matter is more quickly deposited. In furtherance, then, of relieving the limb from the sequestrum, I have seen cases in which, when this has been quite detached, and one end of it has been near an opening, at the same time that the opening has increased in size, the end of the dead bone has protruded into it, and gradually started out, and becoming ultimately completely dislodged. I have often watched a sequestrum in its advance, and been able to appreciate its daily alteration in position, so quickly has it taken place; still more, with equal rapidity the new bone has subsided into its diminished and proper size, as the sequestrum was discharged. These are beautiful examples of the powers of nature. Why, then, may not the surgeon leave some operations to her better workmanship?

"These cases also prove that there is a power, besides muscular action, which can put in motion parts of the animal structure. I have very often seen, as I before said, the necrosed bone, day by day protrude with such surprising rapidity, that each day's work was quite apparent. I have seen the greater part of a tibia, which, when once started into the opening, has been quickly and completely extruded. I had a child in the hospital, not long since, about four years of age, in whom the whole femur, from the condyles to the head, came clear away. It is gratifying to see, that as the dead bone projects outwards from its case at the one end, so, at the other end, the new bone at once, and rapidly, resumes the lessened bulk and form of its proper dimensions. This child, very quickly after the sequestrum was quite discharged, was able to run about the ward. There can be no doubt that there are powerful agents, which can relieve the animal structures, and expel offending bodies, without the intervention of muscular motion. We have several analogies in the course of pathological observations that carry with them the truth of this principle. Even in many of the mere exfoliations of bone, where it is well buried in deep parts, the exfoliated portion will rise and appear at the surface of the wound. Its presence becomes the stimulus for its extrusion, just as the particle of dust from under the eyelid. It is an example of the simple stimulus for relief. In all the varieties of necrosis, the surgeon is called upon to treat with caution and reserve the case, if he weighs duly his responsibility to the patient.

"There is a form which sometimes occurs of a tedious and intractable nature. It is that in which the bone appears outwardly diseased to no great extent, but the examination of it with the probe detects the interior, or cancellous parts equally, or even more, diseased than the surface, the whole part being very painful; and the process apparently going on, presents no indication of being that which I have designated as a function for relief.

"The disease will go on in this course for years, and present none of the salutary processes for restoration to health. As the pain continues uninterrupted, the patient's constitution suffers after some time.

"Cases occur where the effect of periostitis has been to leave the necrosed bone under a different condition to that of a complete incasing of the dead portion. The cases I allude to are when the disease has its seat in a considerable portion of the posterior aspect of the femur or tibia, which are discovered by the probe completely deprived of periosteum; this membrane not seeming to take on the processes necessary for the formation of the bony case, but remaining unchanged and inactive in its powers. The provision of leaving openings for the escape of matter is maintained by the formation of sinuses through the fascia and integuments. The front aspect of the bone, or the opposite one to the diseased, is thickened and increased in bulk, in order to keep up the strength of its structure. As the dead bone does not become encased by a new formation, so the excitement to throw off this part is probably less; the period at which it is got rid of, is, as far as I have observed, very uncertain. I believe that when this dead portion exfoliates, or is detached, that the deficiency is not repaired, and a degree of deformity remains in the bone, because the increased bulk in the opposite side is permanent. Perhaps, as the bone is made effective for all the purposes of the limb in its economy, so there is less activity called forth for completing the reparation.

" The alterations in the periosteum, which I have been adverting to, have terminated in producing positive death of bone. I have now to notice a state of the periosteum, which only so far alters the bone as to give the semblance of disease of it; but this really is not the case. This is a state of things which has not been noticed, as far as I know, by any one. It is a state of the periosteum which consists in an alteration totally different from that where all is life and animation. This state is, on the contrary, that of little vascularity: the structure is thickened and become indolent, and when cut into, gives the sensation of parchment. In all the cases that I have had to treat, it has been the result of blows, but not of severe ones. The blows have not been of that kind as to induce the sufferer to pay much attention to them at the time, but yet quite enough to fix upon him the remembrance of his having been hurt upon the part. The disease is slow in developing itself, and is hardly attended with pain at first; but this, however, gradually comes on and increases to a degree that it is quite severe, although the apparent mischief seems so slight. In its further progress a very slight rising is felt, and the pain is increased on pressure. The derangement produced in the part seems hardly enough to call forth the excitement to the function of repair.

" Some years ago, a gentleman applied to me, with a small swelling on the forehead, which had gradually become very painful, so much so as to incapacitate him from attention to any subject requiring application. He remembered having been overturned in a mail coach three years before. He was little hurt anywhere, but was struck on the forehead: a few months after, he felt some pain commencing in this part. He now complained bitterly of his sufferings, and a small swelling was to be felt in this part. He had been under treatment for two years. I made an incision through this thickening, which was about the size of a shilling; the periosteum was thickened, and bound tightly over the bone, which was quite rough, and full of excavations. I fully regarded it as dead to a certain depth. The pain was immediately removed, and in three days the bone began to granulate; in a fortnight the wound was healed, and no exfoliation took place. The patient, in every respect, was quite well. This case made a strong impression upon me, as I fully expected there would be exfoliation, and that all the tediousness of this process would follow.

" A barrister, going one of the summer circuits, had his daughter with him, a child about twelve years of age. He had her on his knees, when she struck him with her country-made shoes on the shin. He felt but little of the blow at the time; but several months afterwards pain began to arise in the part, which increased to that degree that he could neither get rest nor fulfil his usual engagements, which, in consequence of his professional standing, were very numerous. I detected a slight thickening of the periosteum, about the size of a horse-bean, and cut down through the thickened part. I found the periosteum thickened, and tightly bound over the bone, which was rough and excavated with depressions. I was in this case enabled to assure the patient that there would be no exfoliation, that the bone would granulate, and that the wound would soon heal. He at once lost all pain by the incision, and was soon well enough to resume his attendance in court.

"I had a patient placed under my care in the hospital, whose complaint was, as he represented, very severe external pain in his head of long standing. On examining the scalp, I found that there were certain spots, which he felt exceedingly tender, and I detected in these parts the most trivial rising of the pericranium. On inquiry, he informed me, that several months before, he had been beaten about the head. I now knew precisely the character of the complaint, and immediately cut through all the raised parts that could be discovered; on doing which he was immediately relieved of all pain in those spots,—the bone was rough under each, and the pericranium like parchment. On the next day he pointed out to me one or two other very small places, and having experienced the great relief from the preceding incisions, he begged to have these divided. This was done, and they all quickly healed; and in less than a fortnight he left the hospital quite well.

"This is essentially an alteration in the structure of the periosteum only, the bone merely suffering by implication. When the extent of the altered periosteum is of large breadth, then the bone loses, in some parts, its vitality. If, on the one hand, the general feature of the injury is not to injure the bone primarily, so, on the other, I have not seen these cases occur when blows were accompanied by wounds, so that the force which effects the mischief seems to expend its power upon the periosteum. We have frequent instances of observing that, in the infliction of injuries on the body, the impetus of the force may be expended on different structures lying in the line of the direction of the force, and not necessarily on all, or any one especially.

"The state of a living structure lying loosely over dead or inactive subjacent parts, as it occurs in practice, always gives rise to great pain; and as it is a pain not arising from actions calculated for relief, and for the restoration of the part, so it is a pain remarkably oppressive and injurious to the whole system. I have often seen living cutis vera lying loose over inert sores, very painful; by dividing this isthmus of skin passing over and stretched across, the pain instantly has ceased. So a piece of skin merely lying over a part of necrosed tibia, has been relieved from all pain by dividing it. This little operation expresses, in fact, the great relief afforded by the division of the integument of carbuncle; but another principle is involved in the efficacy of the treatment of that case.

"There is yet another state of the periosteum that I think proper to allude to. I have very often had to treat a chronic form of periostitis, which is hardly noticeable in its accession, and slow in its progress. I think the most common seat of this is in the femur just above the condyles, and also above the same processes in the humerus. These affections may be mistaken for disease of the neighbouring joints, particularly that of the femur, which is often set down as disease of the knee. I have no reason to suspect them to be of venereal origin; very often I have been convinced they are not. They affect the patient's health much beyond the importance that might be affixed to the local malady. They rarely fail to yield to the administration of iodine and a moderate quantity of blue pill. The advantage I have observed to be great in the use of the latter medicine; before the adoption of iodine, I have generally seen the cases yield to mercury; I therefore give it a place in this treatment."—Pp. 137—148.

Then follows a discussion on inflammation of the fascia, its causes, peculiarities, and effects. With this he conjoins inflammation of the bursae, for what sufficient reason we cannot see.

V. Next come furuncle or boil, and carbuncle, and the treatment respectively required for each. In the treatment of the latter he justly expresses doubts of the propriety of administering stimuli. The chief derangement which requires to be combated is irritability of the system; indeed, the febrile state either accompanying the carbuncle, or caused by the action which causes that. For removing this he recommends the use of saline medicines. Under their employment, the stomach in a few days comes to its wonted state; and then food is preferable to tonics, and supersedes the use of stimuli.

The truth is, that carbuncle is merely a deep burn from an internal cause; and this deep burn takes place, as John Hunter observed, mostly in those who have lived well. There are excessive action at first, and fever, in which sometimes the patient becomes incoherent and unconscious, until the carbuncular or charring action of the skin and cellular tissue be fully established. After this comes the suppurative fever,—to eject the burnt and dead parts. Several days are occupied in allowing the vital powers to do what the red-hot iron, or a piece of live coal, would accomplish in five minutes. But as the length of time consumed in this operation shows the struggle and resistance of the system, as well as the strength of the animal cautery, so may it be inferred, that all stimuli, everything that adds to the power of the animal cautery, must be injurious. It is rarely of itself a fatal disease, and only becomes so by mismanagement. Oftimes it comes on in the plethoric, and those whose secretions are scanty, in the manner of a remedy to rescue them from more formidable maladies, and maladies affecting organs most essential to life, as the brain, the lungs, and the heart. Mr Vincent states, that though he has had very large carbuncles to treat, he never saw a patient die of the complaint, except when it has been in the head.

VI. *Inflammation of the Filamento-adipose Tissue round the Rectum*, 159–167, *and Fistulæ ani.*—In the first the filamento-adipose tissue is speedily killed, and forms a bad slough with suppuration. Mr Vincent plunges the knife to the bottom of the mass, making an incision large enough to admit the finger. The effect of this procedure is to stop the further progress of the disease, which it generally does, and prevents thereby the formation of fistula. The abscess then generally heals.

This kind of abscess, if left to itself, especially in strumous habits, may open first externally by the side of the anus, and then internally into the rectum; or it may have opened first into the rectum and then externally. When a fistula is thus formed, or even without the intra-rectal opening, when an external aperture has been made, and lint is inserted to the bottom of the cavity or sinus, if it be thrust out a little at each dressing, it shows the contracting tendency of the parts; and this the surgeon ought to favour, by inserting the charpee less deeply at each subsequent dressing.

The name *fistula in ano* is rather vaguely applied; and not only has it been applied to the true *fistula*, as above described, but also to a sinus running up alongside the rectum, not in the adipose tissue, but along the membranous connections of the tube. This complaint is always accompanied with, and sometimes produced by disease of the lungs. Though usually called *fistula in ano*, it should be distinguished from that disorder; and in its treatment, operation not only does no good, and uselessly tortures the patient, but often it does harm.

Next come what may be called the anfractuous or ramiform sinus *juxta anum*, sometimes multiform sinuses communicating. This state shows, and depends on, an impaired and feeble condition of the general health, probably, according to the author, irregular function and disease of the liver. Operation is contra-indicated. The health must be improved; and then the complaint disappears by the sinuses healing up. The author speaks unfavourably of its termination; and certainly the constitution may be so much disordered as to be inadequate to the effort of granulation and adhesion.

The next mentioned is the dissecting abscess of the ischio-rectal adipose tissue,—a formidable disorder, and generally fatal. The whole cellulo-adipose tissue around the rectum becomes dead and detached from that bowel and the adjoining organs, as the neck of the bladder and the perinæum.

VII. *Piles external and internal*, p. 167.—Internal piles Mr Vincent cuts off by the knife; then he directs the injection of a solution of sulphate of iron in water, one grain to one ounce, which arrests all inconvenient bleeding. Of ligatures he disapproves, as painful and not always safe. We have known it cause fatal inflammation of the rectal veins.

In prolapse of the rectum, he recommends, as very useful and effectual, the injection of a solution of sulphate of iron; and under the employment of this remedy for one week, two weeks, or at most one month, he has seen the disease so often cured, that he is disposed to regard operation as unnecessary.

VIII. *Strictures of the Urethra.*—Not always the metallic bougie. The cat-gut one is most eligible in very tight strictures. Mild and gentle measures are here preferable to forcible and hasty proceedings. He fully believes that a stricture can be cured, if a fine cat-gut can be once got into the bladder. A catheter retained in the bladder, either for stricture, fistula, or diseased prostate, is hurtful. The parts should always be left as much as may be possible to their own efforts, to the discharge of the urine by the urethra; and all interference with this course is injurious.

The prostate gland is much more frequently diseased than is usually believed. Probably there are few cases of gonorrhœa in which it is not diseased. In other cases it is liable to become enlarged as life advances, and to produce the usual symptoms. The silver catheter is preferable to the elastic gum one, with or without the wire. When the manipulator is familiar with the course of the passage, then the elastic catheter, which retains its curvature without the wire, is an excellent instrument. We have seen patients, after having felt both instruments, prefer decidedly the elastic gum catheter. At the same time, we think that the silver instrument in good and gentle hands is the best of the two. The best curve Mr Vincent recommends, is the large segment of a circle of large diameter. But the method of using the instrument he allows to be the great point. "The operator may commence the introduction of the instrument as he pleases, but it should be kept gently moving on; and when the point gets to the arch of the pubis, the handle should at the same time be kept close to the groin, and as the point moves forwards the handle should be brought round in front of the abdomen, and then brought forward, by which movement the point will readily take the upward direction that leads into the bladder. But in all difficulties, although slight, the finger should be passed into the rectum to guide the instrument."

IX. *Fistula Lacrymalis*, p. 211; *Strictures of the Œsophagus*, 212; *Sprains and Bruises*, 212.

X. *Hemorrhage. The Hemorrhagic Diathesis*, 215.—It is well known that in some persons the smallest wounds are liable to pour forth blood for a long time, and, in certain instances, slight wounds in this class of persons have terminated fatally. Thus a common cut, a puncture, the wound left in the gum after the extraction of a tooth, have all been the causes of profuse, and in certain cases fatal hemorrhage. It is not easy to know these individuals before the occurrence; and in some instances the first wound has terminated the life of the individual. Nor is it easy to understand the exact cause of this hemorrhagic disposition. The most probable explanation is, that it depends on a deficiency of fibrin in the blood, and a consequent deficiency in the coagulating power of that fluid. It is well known, that in the warm-blooded animals, or those that breathe by lungs, when the blood is exposed in wounds to the atmospheric air, it is coagulated more or less rapidly. This is the case of course in man; and one of the most prompt and effectual means of stopping hemorrhage from wounds is to expose the wound to the air and keep it cool, and thus cause coagulation of the blood. In cold-blooded animals and those which breathe by gills and bladder-like lungs, as the frog, tortoise, and similar animals, the blood on the other hand does not readily undergo coagulation on exposure to the air; and it even continues long fluid. There is no doubt a smaller proportion of fibrin in the blood of these animals than in the blood of the MAMMALIA and BIRDS; but whether this smaller proportion of fibrin is the cause of the blood thus continuing fluid, it is not easy to say. In persons of the hemorrhagic diathesis, the blood does seem to make an approach to the blood of the REPTILES, in so far as it does not coagulate readily, and sometimes not at all on exposure to air; indeed it continues to flow in these persons, resembling a thin watery, though blood-coloured liquid.

It is needless to say that this peculiarity must prove a great evil to the surgeon and the dentist; and in point of fact it has done so. Various expedients have been proposed for checking hemorrhage taking place under these circumstances; and sundry fatal accidents occurring in this very city have led two able dentists to propose different mechanical contrivances for arresting the flow of blood from the gums after extraction of teeth, in which the hemorrhage threatens to proceed to a formidable extent. This subject has occupied the attention of Mr Vincent; and he thinks that he possesses a certain remedy in the application, internal and local, of oil of turpentine. The remedy has been known now for one hundred and seventy years to be a powerful agent; for so long a time has elapsed, since it was originally proposed and strongly recommended as a stiptic by James Yonge, an eminent and intelligent surgeon at Plymouth. We have often employed it in the treatment of internal hemorrhages, and employed it with good effect apparently; and if it be so useful in those which are external, yet depend on a constitutional cause, it certainly deserves attentive trial. Let Mr Vincent be heard.

> "Some years ago, a youth was brought to me who was passing blood in his urine. I ordered some draughts, with a few drops of oil of turpentine; the bleeding quite stopped before the end of the second day, and did not return. About a twelvemonth afterwards he was brought to me, having cut his finger, but slightly; it had continued bleeding for some days; I gave him turpentine again, it stopped in a day or two. Not long after, he came a third time to me; he had a tooth extracted, and it had been bleeding for several days; the turpentine was had recourse to, and the remedy soon acted in the same sanatory way. I have several times been called in on account of hæmorrhages where teeth have been extracted, and have never seen the turpentine fail in this, nor in other similar cases of hæmorrhage. Not only is the administration of this medicine by the mouth so efficacious, but the local application is also powerful in stopping bleeding, and happily so, as it anticipates the time the other method requires for effecting the purpose; at all events, it is a powerful auxiliary. The use of it is to be made with the injunction that no coagulum should be allowed to remain upon the part. I was on the point one day of leaving London for a few hours, when I was called upon to a case of bleeding from the socket from which a tooth had been extracted, and that in considerable quantity, the subject being a weakly middle-aged female. My confidence was such in the power of my means, that I left instructions to clear away the coagulum, if any, and to apply turpentine to the part, and I ordered draughts of it to be taken, and went away without waiting to see the effect. I learnt afterwards that the bleeding had soon stopped, and the medicine internally was not wanted."—Pp. 216, 217.

As little seems to be known of the original history of oil of turpentine as a stiptic, we shall notice it more fully in the third part, or Medical Intelligence.

If Mr Vincent's proposition as to the use of turpentine be not entirely new, he advances, as to the suppression of hemorrhage, another proposition, which certainly differs widely from the wonted and received practice.

It used to be taught that the most common and ready means which nature employed to suppress hemorrhage, was by the formation of a clot, within the mouth of the open artery and around its cylinder; and consequently the surgeon was uniformly advised, at least since the publication of the essay of Dr Jones, not to disturb or remove clots; but to leave them where they are formed, as the best aids which he could employ in repressing the hemorrhage. Mr Vincent takes a method altogether opposite, and removes all clots whatever:—

"The most important step in managing all cases of bleeding is, that the surgeon should be most careful to keep the bleeding vessel free from all coagulum. The smallest arteries will go on bleeding if they are covered with a clot, and many considerable hæmorrhages will stop if the bleeding points are quite clear from all blood; even rather large arteries will sometimes permanently cease to bleed, if kept uncovered and exposed to the air. This fact I have seen. It is known that if a divided artery be in contact with a layer of fibrine, it has a strong affinity and aptitude to shoot into it, and it is possible that a clot of coagulum has a modified effect of this sort upon the orifice of an artery, so as to keep it from contracting and closing. It is, however, certain, that a coagulum over a bleeding artery keeps up hæmorrhage. It is by this means that all styptics have generally failed, while for the most part they have only done what bare exposure will generally effect; if the blood be carefully removed, and the styptic be applied, it has the credit of supporting its character, but generally, if the blood be removed and kept from forming a coagulum, the vessels will cease bleeding, as the effect of the mere exposure of the part. The doctrine explaining the use of plugs of coagulum about an artery, to restrain its bleeding, was never to me very convincing. I know practically that arteries of a considerable size, such as those about the hand, of the size even of the radial, will cease to bleed if left quite exposed, and kept freed from the formation of coagulum taking place about them; so, when the socket of a tooth bleeds, if it be kept quite clear of coagulum, and the oil of turpentine be applied, it will succeed in quickly arresting the bleeding.

"I have every reason to feel assured, from what I have tried in these cases, that the bleeding may be stopped in epistaxis upon these principles, by which the patient may be saved from the annoyance of what is called plugging. The plan of the proceeding that I have adopted is to keep the parts which are bleeding freed from all coagulum, and this should be done in this case by syringing the nostrils, so as to wash the blood out. Now if a styptic be used, such as the sulphate of zinc, it coagulates the blood as it issues from the vessels, and so far stops the bleeding; but there is a process going on, by which this clot is loosened from its adhesion, and, perhaps, on the second day the bleeding is renewed. This will happen repeatedly; so that these cases have ended by being plugged. But what I contend for is, that if the syringing be carried on until the bleeding ceases, it will not only stop, but not recur. It is generally considered of importance, that the water used in cases of bleeding should be cold; but from what I have observed, arteries will contract under the use of warm water, which has a better effect in clearing away the clots, and keeping the parts clean from the blood. I have already alluded to the influence of a coagulum in keeping up bleeding, when speaking of the necessity of squeezing out the coagulum in a pile when it is opened."—Pp. 217—219.

In suppressing bleeding from leech bites, often a dangerous accident in children, he finds that the best plan is to unite a small piece of lint into a hard knot, less than a pea, and wiping the orifice clear of blood, to place this little pad on the bleeding orifice, and then, taking advantage of the elasticity of the integument, to draw tightly over it a strip of adhesive plaster. This is sufficient to stop the hemorrhage, and on the third day the wound is closed.

By extending this principle, and employing a larger pad, he has succeeded in stopping the bleeding from arteries of tolerable size, as the *superficialis volæ*, and the superficial palmar arch. This plan, he assures the reader, presents great advantages over the usual method, both in the facility and simplicity of the application, in the efficiency of the means, and the ease with which the wound is afterwards healed. He therefore rejects entirely the proposition of applying a ligature to the radial and ulnar arteries for suppressing hemorrhage from arteries on the hand.

XI. In treating hemorrhage from ruptured veins, it is of the greatest importance to enjoin the observance of the horizontal posture. The same is to be observed of varicose veins. The best remedy for counteracting the bad effects of varicose veins,—for these are not susceptible, properly speaking, of cure,—is friction by means of the flesh-brush, which is much more efficient than bandages or any other contrivance, in strengthening and restoring relaxed, swollen, and varicose veins. The largest proportion of ulcers requiring treatment at St Bartholomew's are those in which the veins are varicose, dilated, or otherwise diseased; and the most effectual treatment is by means of rest, local depletion by means of leeches, and then, when the ulcer is healed, the daily or frequent use of the flesh-brush. To the good effect of both the latter remedies we can bear strong testimony, having often been enabled to afford great relief to sufferers, first by the application of leeches, and afterwards by the use of gentle friction. There is a state of varicose veins to which the use of leeches we have found is particularly well adapted. Besides the large swollen and bulging trunks, there are, at various parts of the leg, ankle, and instep, large clusters of very small veins, all anastomosing, the seat of great heat and no small degree of pain. It is manifest that some degree or process of inflammation in these vessels is proceeding. Depletion by a few leeches in this state operates promptly and decidedly in affording relief. This may be called telangiectasis of veins. Mr Vincent allows that varix seems to be often connected with phlebitis; indeed, an incipient form of that affection (p. 230). To us it appears that either there is chronic inflammation of some of the venous coats, or a disposition to inflammation. In the venous capillaries, there appears to be either great accumulation, and obstruction, and stagnation, or actual inflammation.

All ligatures and other means of obliterating diseased veins are hurtful as well as irrational. To obstruct or obliterate the channel of one of a cluster of diseased veins, is only placing the others in circumstances to become more diseased.

In the treatment of chilblains opium has the most beneficial influence.

XII. Senile gangrene is most commonly induced by an injury or some violence done to the leg or foot. The ossified state of the arteries is merely a predisponent cause. The arteries in many persons are ossified and diseased without giving rise to senile gangrene. But in persons with this state of the arteries, slight injuries, and so trifling a cause as paring a corn, have been the means of inducing gangrene terminating fatally. Nevertheless, the disease appears in certain circumstances to be capable of being warded off. Usually, premonitory symptoms first appear, in the shape of heat, pain, and blushes of redness in the foot, toes, or instep, acute pains in the calves and hams, and blue-coloured, purple, or dark-red patches in the skin. Opium has in this also a beneficial influence. The author, however, does not speak so confidently of the effects of this drug as Mr Pott did.

Mr Vincent mentions the occurrence of gangrene in the extremities of the fingers in a young woman of nineteen, and in whom no pulsation could be felt in any artery of the left upper extremity, up to the *scaleni* muscles. The gangrene went no higher than the fingers and thumb. We have seen in a young woman, a little above twenty, all pulsation stop as high as the middle of the brachial artery for eight days, yet not to be followed by gangrene.

XIII. In the severe affection of the throat which follows, in young children, the attempt to drink boiling water from the mouth of a tea-kettle, the tongue and mouth are scalded, and the membrane of the fauces and the glottis partake of the effusion and swelling, so as to cause threatening suffocation. Several children, indeed, die of suffocation from this cause. By the application of one leech or two, according to the age, and the administration of calomel and antimony, in most of the cases, the symptoms have subsided in twenty-four hours. Often the breathing has become free immediately after the application of the leeches. It is a strong proof of the ascendency which medical management is acquiring over surgical treatment, that the author never mentions, for the alleviation and removal of this affection, the proposition of puncturing the vesications of the epiglottis and glottis, or such a proceeding as tracheotomy.

XIV. Rose is liable to supervene on burns and other injuries of the skin and cellular tissue. There is no reason to believe that it is infectious. Its formation seems to depend on the state of the atmosphere. But there are, in the secretions of the human body, conditions which certainly favour the production of the disease. At its commencement, the secretions are not only vitiated, but in general suppressed. If there be an ulcer, the secretion of matter ceases, and only a little orange-coloured moisture appears on its surface. The alimentary canal is deranged; the biliary secretion is altered; the urine is scanty and high-coloured; the skin is dry; the tongue is white, but not loaded on the surface, with the edges unusually red. The pulse is small, quick, with a sensible jerk. So uniform are these states of the tongue and pulse, that if with their presence a few leeches be applied for any local complaint, rose is sure to supervene.

Conversely, if this state of the tongue and pulse quickly disappear, the erysipelas in like manner rapidly subsides. It is liable, however, to recur with renewed vigour on the use of wine, and more particularly of ammonia.

XV. Chronic abscesses are most conveniently treated by discharging their contents by means of a troisquart, and then healing up the wound as quickly as possible.

XVI. Phlegmonous abscess round the knee, occurring in female servants who have to kneel much, is to be distinguished from inflamed *bursa*, or the housemaid's knee. It is inflammation beneath the fascia. It should not be interfered with by leeches or similar means, but allowed to proceed to suppuration, after which it should be opened, and it usually does well. If the smallest quantity of matter is formed, leeches are hurtful in retarding the progress towards cure.

Of the diseased state of the bursa over the *patella*, called the housemaid's knee, there are various conditions. They seldom get well without absolute rest. When the cyst is not thickened, leeches are useful. When the cyst is hard and large, blistering is useful, and indeed counter-irritation is generally necessary. If possible, they should not be opened. But sometimes they suppurate, and their opening is necessary, though only to be done when suppuration is completed. Removal of these *bursæ* is a most dangerous proceeding, and often is followed by death.

The name of housemaid's knee may be applied also to inflammation and thickening of that *bursa* which is placed between the ligament of the patella and the head of the tibia, also caused by kneeling. The complaint is attended with much pain, and is more difficult to be cured than that which forms upon the *patella.*

Then follow some judicious observations on scrofula.

XVII. Among counter-irritating remedies for the treatment of diseased joints and similar maladies, the author assigns the preference to the issue formed by caustic potass. This, he argues, induces a more elaborate train of healthy actions than by any other means. Blistering is less effectual, and to some not less irritating. The issue is particularly useful in disease of the synovial membrane of the knee-joint. Mechanical aids and means are of no use. Rest in bed on the side alone affords relief, and furnishes that state of quietude which is favourable to the removal of the diseased action. The author has rarely seen the synovial disease proceed to a destructive result, where the case has been actively treated by means of issues. In cases even named ankylosis of the knee-joint, the real seat of the junction is between the patella and the part of the femur in which it is lodged. The extensor muscles are then unable to extend the limb. Would it not be more correct to say, rather, that as the disease is mostly seated between projecting points of the femoral condyles and the fore-part of the head of the tibia, as well as inside the *patella*, so the only way to remove these parts from hurtful pressure, is by half bending the knee. Thence the extensor muscles are not permitted to act, because their contraction puts the diseased parts in a painful position, while the flexors instinctively bend the two bones, so as to draw them out of this painful position. If, in this state of the joint, the leg be extended on the thigh, by external means, however gently and however slightly, the flexors instinctively bend the former bone on the latter.

In rupture of the tendon of the *plantaris* muscle, the best plan is to avoid the use of bandages, restraint, and all mechanical means. Even much rest is bad. The patient may rest first in bed for one or two weeks; then on a sofa without any restraint on the limb, which, however, should be kept in the easiest position. Afterwards it is good to attempt to move about gently and carefully.

XVIII. The author professes inability to discover the reason of the proposition that has been made for slicing off protrusion of the brain. The cavity of the skull, he observes, is fitted for the natural bulk of the brain; and if the bulk of the organ is so enlarged, that it presses out at any opening that will allow it to do so, the state which produces this enlargement will not be relieved by diminishing the mass. The rational view of the case is to cure the state which is hydrocephalic; and the influence of mercury is the means of cure. In cases of this order, we have seen the best effects from blood-letting, general and local, by means of leeches and the application of cold water to the injured part. It is astonishing how rapidly and completely the protrusion subsides under such means. Mercury, accordingly, was unnecessary.

XIX. In the operation for hernia, sleep is an auspicious symptom. If the patient do not sleep, the accession of peritonitis is to be apprehended. The author has no reason to think that peritonitis is ever removed by bleeding or by blisters. It seems a disease not to be arrested by any other remedy than by the use of mercury, to which, he feels assured, that it will yield.

"I had a female patient in the hospital a few years ago with femoral hernia, on whom I operated: the bowel was sphacelated, and an artificial opening was left; she had peritonitis to a great degree. I put her upon mercury, and on the third day her mouth became affected; the symptoms altogether then changed, and not many hours after quite left her. The wound healed very quickly for such a case, as she was very soon free from the artificial anus." —Pp. 326, 327.

This and a similar instance are strong cases, and we acknowledge that we have seen good effects result from the use of mercury in this disease. But we have also to add, that we have seen cases give way to blood-letting and the use of opiates with oil of turpentine.

XX. Then follows a lengthened but sensible discussion on gonorrhœa and chancre, and the use and abuse of mercury. The author is decidedly favourable to the use of the mineral, either in the form of inunction or that of fumigation by means of cinnabar, the latter of which, he says, he never found fail in arresting the progress of ulceration, often so rapid in the throat, and also ulceration in the penis.

The last subject treated is skirrhus and cancer. On the question of operation, the author expresses himself less decidedly than, from his language and views on other subjects, we should have expected. It is clear, however, that he allows that the disease is not removable by operation; and that operations undertaken with that intention do not prolong the life of the patient. Every thing now known regarding skirrhus shows that extirpation, when practicable, does no good; and that it is better not to interfere with skirrhous tumours either in their early or ulcerative stage. In no instance has a true skirrhous tumour, that has been removed by operation, failed to return, either in the same part, or in some other texture or organ; and in some instances the advent of this result is accelerated by operation. It is indeed a mere question of time. The reappearance of *enkephaloma* is still more speedy.

This volume contains, it will be seen, much useful instruction in the practice of surgery, and matter for much profitable reflection to the surgeon. In one respect, it ought to be of great use in rectifying the current notions of surgeons regarding the propriety of operations. To these undertaken in the indiscriminate manner so often observed, we can discover that the author is decidedly opposed; and he evidently trusts for the accomplishment of his objects in relieving patients, more to medical than to surgical treatment, properly so called. It is, indeed, an important point in the history of surgery, in the middle of the nineteenth century, that, in the hands of two of the first and most accomplished surgeons in the metropolis, surgery is no longer the mere work of the hand, nor is the chirurgeon one who works by the hand and instruments only. A revolution in the practice of surgery is evidently in progress. The merely operative department has received from both these gentlemen a heavy blow and great discouragement. The medical department, on the other hand, has been placed in its true position, and exalted to its just rank. The surgeon is taught to use his head more than his hands, and to employ as his aids and instruments the functions and powers of the living body. Every one competent by knowledge and observation to judge, will admit that this is a beneficial change. It is impossible to deny,—looking at the usual results of operations, and the small proportion of them which really afford relief, arrest the progress of disease, and tend to prolong life,—that they have been greatly too often resorted to, that they have been performed when they ought not to have been performed, and that, in a large proportion of cases supposed and usually taught to require operative measures, it would be wise to leave the matter to the natural powers of the system, aided and guided by judicious medical treatment. It would be unreasonable to expect that operations could be entirely abandoned. Circumstances must occur in which they become requisite. The great thing is to distinguish correctly these circumstances, and, in the actual practice of surgery, to reduce operations to the smallest number and proportion possible. If, in accomplishing this desirable revolution, the writings of Sir Benjamin Brodie and Mr Vincent exert their proper influence, they will have rendered a greater service to the art which they practise, than by all the operations which they have performed.

ART. II.—1. *A Treatise on the Enlarged Tonsil and Elongated Uvula, in connexion with Defects of Voice, Speech, and Hearing, Difficult Deglutition, Susceptibility to Sore-Throat, Impeded Respiration, Disturbed Sleep, Throat-Cough, Nasal Obstruction, and the Imperfect Development of Health and Strength in Youth.* By JAMES YEARSLEY, M. R. C. S., &c. &c. London, 1842. 8vo, pp. 80.

2. *A Treatise on the Diseases of the Air-Passages. Comprising an Inquiry into the History, Pathology, Causes, and Treatment of those affections of the Throat called Bronchitis, Chronic Laryngitis, Clergyman's Sore-Throat, &c.* By HORACE GREEN, A. M., M. D.; Formerly President, and Professor of the Theory and Practice of Medicine in the Castleton Medical College; Vice-President of the New York Medical and Surgical Society, &c. &c. New York and London, 1846. 8vo. Pp. 276.

3. *Dyphonia Clericorum, or Clergyman's Sore Throat: its Pathology, Treatment, and Prevention.* By JAMES MACKNESS, M. D., M. C. Physicians, London; Consulting Physician to the Hastings Dispensary. London, 1848. 8vo. Pp. 125.

A CONSIDERABLE proportion of those diseases by which human life is either embittered, abridged, or terminated, are the consequences of overtasking particular organs. The stomach is overworked in the opulent and wealthy classes, and the injury thus done evinces itself in various disorders either affecting that organ itself, or some of those connected in function with it. The brain is overworked in not a few engaged in business, scientific pursuits, or other occupations; and this also produces its legitimate effects in a great variety of maladies,—palsy, epilepsy, insanity, idiocy, and, in some instances, apoplexy. When the two organs now mentioned are from any causes overworked at the same time, the effects are not only more promptly and rapidly produced, but they are characteristically decided; and to one or other of the two errors now specified, may be traced a large proportion of the diseases incident to men living in the artificial and rather forced habits of civilized life.

Among the organs subjected to this overtasking of their natural powers, those of voice suffer chiefly under peculiar circumstances. The larynx, it may be argued, is constructed of sufficient strength in the generality of individuals to perform all the duties assigned to it; and unless, when grievously overtasked, and its exertions are too long continued, the organ generally proves equal to ordinary exertions. In certain states of society, however, in which it becomes requisite to make great and long-continued efforts with the vocal organs, they show, as in other cases, the same inability to preserve their original strength; and the result is, that in certain individuals, indications of failure in the powers, and disease in the parts, of these important organs begin to be manifest. In all countries, and in those states of society, in which men have occasion to make much use of the voice, in speaking above and beyond the natural compass, it is liable to suffer, unless due means be taken to afford temporary rest and relaxation. This, though liable to all men, is further most likely to take place in those in whom either the system is not very robust, or the particular organ is more feeble than in the average of the human race. Public speakers of all kinds, singers, and especially clergymen, are those who, from obvious causes, are liable to various disorders and maladies of the organs of voice. Yet not all these orders of persons who exert the vocal organs are equally subject to disorders of this nature. Singers are more liable than public speakers; but clergymen are most liable of all.

In these persons there is every reason to believe that the throat, or *fauces* and *larynx*, are liable to several different disorders. But that to which Dr Green assigns the most prominent and important place, is an affection of the follicles or small glands in the membrane of the pharynx and larynx, in which these follicles become enlarged, sometimes infiltrated with tubercular matter, and occasionally affected with ulceration. According to Dr Green, it is not more than twelve or fifteen years since this aggravated form of disease attracted attention in the United States. He finds that it had not been observed previous to 1830; and he informs the reader, that it was only in 1832 that the first well-marked case of the disorder in the person of a clergyman, came under his observation and treatment. He allows, however, that during the preceding year, the attention of practitioners in different parts of New England had been called to the fact, that many clergymen in different sections of the country were seriously affected, and in some instances were wholly incapacitated for public speaking, by a distemper of the throat, which was characterized by symptoms of a peculiar nature and of unusual severity. Its occurrence about or subsequent to 1830, he ascribes to the prevalence of the epidemic influenza, which not only spread over all the States of the Union, but extended over the whole of Europe, and probably over the whole world. Whether this epidemic, or the causes on which it depended, had any influence in increasing the frequency of the disease under consideration, or in changing its character into one of a more malignant nature, cannot now be ascertained. It is certain, nevertheless, that while the influenza of this period was the precursor of epidemic cholera in some parts of the world, it was in many parts of the United States early followed by the appearance of follicular disease of the throat.

This statement seems to be perfectly correct and free from serious errors as to the peculiar form of the disorder designated by Dr Green Follicular Disease, as occurring in public speakers, especially clergymen. We think, however, that this same follicular disease was known and existed previously, though not so generally; as it appears to have been known to Trousseau and Belloc, and also Cruveilhier; while we can say that we have seen and had occasion to treat the same disorder, previous to the time specified by Dr Green. To us it further appears, that the membrane of the throat and larynx is liable to several different affections which may impair and destroy laryngeal voice; and some of these,—we do not call them specimens of follicular disease,—became known to us so far back as 1824 and 1825. In one instance, the case of a clergyman, the individual withdrew from the active duties of his living, in consequence of the total failure of his voice, and his inability to speak above a whisper.

The membrane of the throat, including that of the pharynx or *fauces* and the larynx, is one of peculiar structure, and not less remarkable sympathetic and functional relations. It is a mucous membrane, highly vascular, extending all over that space denominated *fauces* and *isthmus faucium*, behind into the pharynx and œsophagus, before into the larynx and trachea. Its relations as an organ of deglutition are connected with the former canal;—as an organ of speech and voice with the latter. Besides being itself provided with those minute saccular glands called follicles, it is extended on each side of the fauces over a cluster or conglomerated mass of glandular bodies, named tonsils or *amygdalæ*. In the throat or fauces it is very vascular, moving easily over the subjacent parts, and moved also by various muscles connected with its attached surface. The free surface of this membrane is covered by a mucous epidermis or epithelium, of the kind denominated by Henle plaster or laminated epithelium, and which consists of stratified layers of flattened nucleated cells placed above each other, and so closely, as to form a covering of some thickness and strength. Subjacent to this is the mucous corion, a thick gelatinous web, in which the blood-vessels are distributed and ramified to an extreme degree of minuteness, and very numerously. This, when examined by the microscope, is found to consist of two parts; *first*, the basement membrane, or *membrana propria*, a thin film-like but comparatively firm web, on which rests the epithelium; and, *secondly*, a fibro-vascular layer, which is situate beneath this basement membrane. The former or basement membrane seems, so far as is hitherto known, to be almost pellucid, in structure homogeneous, though presenting on its surface marks of nuclei, and from which some have imagined the nucleated cells of the epithelium to be secreted. On the other hand, these marks may be derived as impressions from the nucleated cells of the investing epithelium. External to this is the fibro-vascular layer, which, indeed, is a net-work of blood-vessels, lying between, and ramified among, the filaments of a firm fibrous tissue. This latter part appears to give colour to the basement membrane, and it certainly supplies it with blood, and probably nutriment.

External to these two tissues is a filamento-cellular tissue, more or less loose, by means of which the mucous membrane is connected to the subjacent parts and the muscles, and by means of which it is made to move easily and extensively.

The whole of this membrane is particularly exposed to impressions from particular states of the atmosphere, as moisture, cold, excessive heat, extreme dryness, the unnatural presence of minute dust floating in the atmosphere, foreign gases, as ammoniacal gas, chlorine gas, muriatic gas, carbonic acid gas, sulphuretted hydrogen gas, the smoke of large towns, and the gaseous exhalations of manufactories, vapours issuing from the decomposition of animal and vegetable bodies, and, in short, all substances miscible with the atmosphere and capable of suspension in it. The states of the atmosphere, nevertheless, that most commonly affect this membrane, are cold, moisture, excessive dryness, and unusual heat, and that little known vapour called malaria.

The mucous membrane of the throat is continuous with that of the pharynx and œsophagus posteriorly, and with that of the larynx anteriorly.

As it joins the larynx, the membrane changes its characters. The epidermis, or epithelium, is composed of ciliated cells, which are normally conical, but which also occasionally present the cylindrical and oval figure. If one line be drawn on the *septum narium*, and another upon the lateral wall of the nostrils, from the anterior free margin of the nasal bone to the anterior nasal spine of the upper jaw, this line shows the cessation of the laminated epithelium. All the parts within and behind this line,—the septum, the muscles, the whole floor of the nasal cavities,—are covered by ciliated epithelium; and, in like manner, the entrance into the frontal, the ethmoidal, the sphenoidal, and the superior maxillary sinuses and their cavities, to their remotest recesses, are covered by ciliated epithelium, which also extends, in the manner immediately to be explained, into the upper part of the gullet, and, finally, the larynx, *trachea*, and *bronchi*.

From the cavity of the mouth, the laminated epithelium proceeds over the inferior or oral surface of the epiglottis. At the basis of this body, the ciliated epithelium makes its first appearance, and thence proceeds upon the anterior wall of the larynx. On the posterior and lateral wall of the larynx, the ciliated epithelium first begins close upon the edge of the superior vocal chord, and it thence proceeds to the trachea and the ultimate ramifications of the bronchi.

Beneath this lies the mucous corion, in like manner as in the throat, but firmer and more dense, in various parts, with less of the vascular web.

This membrane is connected to the subjacent parts by filamento-cellular tissue, which varies in different regions. On the upper surface of the epiglottis, it is firm and close. In the glottis, and especially between the upper and lower chords of the glottis, it is more lax, and becoming, on inflammation, infiltrated with serum, causes the peculiar swelling of that region, known under the name of *œdema glottidis*. Over the cricoid and thyroid cartilages, and parts of the arytenoid, it is again firmer, but looser over the different intrinsic muscles of the larynx.

This mucous membrane, that is, both the pharyngeal and the laryngeal, is formed or moulded, as it were, into various recesses or minute cavities, with blind ends, the free surface of which secrete a thin viscid liquor. These are the follicles or crypts of the pharyngeal and laryngeal mucous membrane.

It is generally believed that the epithelium is formed from the basement membrane of the corion; and it seems not easy to understand from what other source it can be formed. It is liable to constant waste or removal by exfoliation of its scales. Thus the epithelial scales of the tongue, mouth, and throat, are undergoing incessant ejection, and are discharged mixed with saliva, or mucus expectorated. To supply this constant waste, the basement membrane requires continually to furnish the means of forming new epithelial scales. This process advances more rapidly and actively in parts exposed to the causes of disease than in others. The epithelial scales of the mouth and throat are constantly liable to be ejected after every cold, and after many other incidents. Those of the frontal, ethmoidal, sphenoidal, and superior maxillary sinuses, are much less liable to ejection or desquamation. Those of the larynx and trachea are, probably, in certain individuals, more liable to desquamation than those of the mouth, but less so than those of the cells of the facial cavities.

Organized in the manner we have here endeavoured to describe, this membrane is the seat of various morbid affections.

In the *first* place, the membrane of the *fauces*, or throat, is, from the causes already specified, liable to become irritated, and reddened, more or less swelled, and to have its secretions deranged. In every sore throat, the effect of cold, there is no doubt that this takes place. But in the strumous, and in those with irritable mucous membranes, the liability to this reddened irritable state is so great, that, if often exposed, the red state becomes constant, and the feelings in the throat are proportionately uncomfortable. A frequent sense of tickling, exciting to hawking and coughing, fits of choaking upon very slight causes, and a certain degree of feebleness of the voice, not constant, but variable, are very common. When this has returned often, it is liable to become established as a constant condition. The irritation, which had acted chiefly on the surface of the membrane, penetrates through its substance to the vessels. The follicles are also affected, and, after some time, the natural functions of the throat are entirely deranged. A throat examined in this state presents the following appearances. The whole membrane is red and vascular, and sometimes varicose branching vessels may be seen in the *uvula*, the pillar of the *isthmus faucium*, and the posterior wall of the pharynx. The epiglottis, if visible, is reddened, and is felt thickened. The uvula is loose, and hangs down much farther than in the natural and healthy state. The tonsils are not always enlarged, but their surface presents a peculiar rugged, unequal appearance, which conveys to an observer, not much accustomed to examine throats, the idea of ulceration. Many irregular depressions or hollows are observed; and beside and around these, are elevations not less irregular; sometimes covered with viscid mucus, always more or less vascular. These appearances, which have been supposed to indicate ulceration of the tonsils, are, nevertheless, not produced by this process. They are caused by the simple enlargement of the component follicles or crypts of which these bodies consist, and which being aggregated together very closely, when affected by superficial inflammation, are liable to give this rugous and irregular aspect to the whole surface of the gland and its investing membrane. In certain cases, they seem rather smaller than natural, as if they had been in some parts consumed or absorbed. It is not easy to say on what this appearance depends, or whether it depends in all cases on the same circumstances. It is not improbable, that the enlargement of various crypts or follicles may, by their compression on contiguous ones, have produced absorption of the latter,—in short, may have caused, by stopping their supply of blood, some degree of atrophy in certain of the crypts. In most cases, however, what we now notice, is a superficial, and probably a partial, affection of the tonsils; superficial, in affecting chiefly their covering membrane and the follicles near it; partial, in affecting not the whole, but only parts of their substance.

The affection of the mucous membrane of the throat now mentioned does not uniformly and in all persons produce hoarseness or *aphonia.* It merely renders the voice of the individual feeble, unequal, and not to be depended on. But it is a great and genuine source of distress and suffering, if the individual has occasion to exert his voice, or to speak above his breath, to read aloud, or in any way to use the larynx. It may be said, why should it be so, if the disorder be as now stated, confined to the pharynx? This question may be answered, so far as it can be answered, by the statement, that a healthy state of the membrane of the *fauces* is almost as requisite to the strength, the clearness, and the smoothness of the voice as that of the larynx; that any affection of this membrane to the extent now mentioned renders the voice rough, feeble, unequal; and that, further, the larynx does not always escape in this affection of the membrane of the fauces. The epiglottis and its membrane are rendered irritable partly by extension of the disorder, partly by the state of the uvula and the tonsils; and not uncommonly the membrane forming the superior vocal chords is in like manner reddened and rendered irritable. But even though the laryngeal membrane be tolerably free from irritation, it is not less certain, that the state of the *uvula*, tonsils, and other parts of the membrane of the fauces now described, exerts a most pernicious influence upon the voice. If any attempts are made to exert the organ beyond its powers, these only add to the evil; render the voice rough, harsh, and croaking; and if the affection have not spread already to the larynx, it in no long time does so.

The persons most liable to this irritable or erythematous state of the throat are of a peculiar temperament. In general, they present marks, more or less distinct, of the strumous habit. The mucous surfaces in them in general are of an irritable vascular character, easily thrown into morbid states which are not always readily removed. They are liable to catarrhal attacks affecting not only the tracheo-bronchial membrane, but the gastro-enteric surface also, and the eyelids. The inner surface of the nasal mucous membrane is peculiarly red, sometimes swelled. The eyelids are also more or less red and swelled. The bowels are irritable, commonly constipated, but easily excited to diarrhœa. In females, leucorrhœa is not unusual. In males, piles appear early, and are unusually troublesome, and sometimes accompanied with other affections of the colon and rectum. In both sexes, dyspeptic symptoms are common.

We have said that in this form of throat affection, the tonsils seem as if atrophied. There is yet another in which these bodies are unusually large, and appear to be in a state of hypertrophy.

In this form of throat disorder, the uvula is equally pendulous and enlarged as in the former, in some instances more so. Its covering membrane is red, soft, pulpy, and swelled. The membranous folds forming the pillars or columns of the *fauces* are likewise large and thick, pressing on and pressed by the tonsils, while they project laterally, and diminish or almost obliterate the arch-like space between them and the uvula. The pharyngeal membrane, when capable of being seen, is equally red, and traversed by varicose distended vessels. But the main characteristic of this form of throat ailment is the enlarged and prominent figure of the tonsils. These bodies, instead of being so moderate as to lie easily between the anterior and posterior pillars of the arch of the *fauces*, project from them towards the middle, in the form of two large pyriform or ovoidal tumours, which often approximate each other. In this state they always contract much, and sometimes to a great degree, the free passage of the throat, while the uvula hanging down between them, seems pressed either to one side or the other more than it ought to be.

The surface of the tonsils is in this state rugous, rough, irregular, with many prominences, the manifest *apices* of the constituent follicles. Rarely is there ulceration. But the membrane, which is reddened and softened, is always covered with a morbid and unnatural secretion, which gives it the appearance, being arranged in patches and specks, of a state of ulceration. When, however, the throat is gargled with tepid water, or a weak solution of alum, it is manifest that there is no breach of the surface.

The persons in whom this enlargement of the tonsils has taken place, invariably speak more or less through the nose, so that a person of experience is able, with great accuracy and confidence, upon hearing such a patient speak, to say that the tonsils are more or less enlarged. Even when sitting in a state of complete quiescence, the breathing is peculiar,—being more through the nose than is natural, and accompanied with a peculiar wheezing or snorting sound. During sleep the breathing is still more noisy; it is then nasal, wheezing, and attended with a snorting noise. Little doubt can be entertained, that when this enlargement is considerable, it not only impairs the voice and gives it a peculiar character, but it affects the function of respiration to a serious degree. Dupuytren having frequently observed that the tonsils were thus enlarged in young persons in whom there was a peculiar malformation of the chest, consisting in the ribs being drawn greatly inward from their angles forward to the sternum, was of opinion, that the enlarged tonsils was the cause of all this mischief; and to remove or diminish the morbid state of the chest and the action of respiration, he maintained, that all that was requisite was to cut off the enlarged tonsils; and this accordingly he did in various instances. We cannot help thinking, nevertheless, that this excellent surgeon viewed the affection through a distorted medium, and mistook a simultaneous effect for a cause. Enlargement of the tonsils in various degrees, is a much more frequent affection than that of the malformation of the chest in question; and it is by no means associated with that malformation even in the majority of cases. Nay, it may be seen in persons with perfectly well formed ribs. All that seems certain is, that enlargement of the tonsils occurs in persons in whom also the ribs may be malformed and introverted; and these lesions may depend on the operation of the same morbific agent.

On the other hand, it must be granted, that this malady of the throat does affect the breathing; and it certainly shows much disorder in the organs of respiration, after every exposure to cold or any acute attack attended with symptoms of fever.

Mr Yearsley has given a very good account of this affection, and illustrated its effects on the throat by good figures. To this gentleman decidedly belongs the merit of having been the first in this country to show the close connection between morbid states of the uvula and tonsils, and various affections of the voice. In a short but useful treatise, published in 1842, he directs attention to the frequency of elongation of the uvula and enlargement of the tonsils, as powerful impediments to the formation of distinct speech and clear voice;* and upon these disorders he communicates a number of instructive facts.

Disease of the uvula he regards as one of the most frequent maladies of the voice to which singers and public speakers are liable. The enlargement of the tonsils, he thinks, cannot be strictly termed hypertrophy, which signifies an increased nutrition of parts, since the augmented size does not consist of the proper glandular substance, but of deposits of fibrin, which are gradually thrown out during the inflammation, or irritation to which they are subject, and in process of time become organized. This organization takes place, he further maintains, only to a limited extent, as they never possess much sensibility when even of the largest size, unless acutely inflamed, and they receive so small a supply of blood in their enlarged state, that even when cut into but little or no hemorrhage takes place. The tonsils, in short, in this state are enlarged from the effects of chronic inflammation.

These enlarged tonsils are farther in this state liable to become the seat of calcareous deposits and concretions. In three instances

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* It is perhaps necessary to remind our readers, that we make a distinction between the terms *speech* and *voice*. Speech means articulate speech, such as it is formed by the tongue, teeth, lips, and cheeks; and it may either be laryngeal or not. When the former, it forms speech above the breath, as it is usually named, and is then accompanied with voice. Voice, on the other hand, is applied to designate the sound, varying in degrees of loudness, but not necessarily or in any way articulate, which is formed in the larynx, and is modulated also by the *isthmus faucium*. Voice may be a loud inarticulate sound, various in its degrees of intensity and strength; from a mere audible sound to a loud roar or scream. This latter sort of sound is not only formed in the larynx by the impulse of the air through the glottis, but its strength depends almost entirely on the integrity and degree of health in which the parts of the larynx are. It is also influenced by the state of the isthmus and tonsils.

Mr Yearsley found such deposits imbedded in the centre of the diseased growth; and in one case, in the person of a young lady, he found a concretion resembling in its arrangement a piece of rock coral.

The affections of the voice resulting from these changes are various forms of *aphonia* and *dysphonia.*

Aphonia, or loss of voice, that is, loss of laryngeal voice, usually comes on after one of the severe catarrhal affections, to which persons with this irritable state of the throat are liable; and, according to Mr Yearsley, it may depend on irritation or relaxation of the vocal chords. Colombat represents it to be occasionally produced by the irritation of the elongated uvula, and relates several cases, in which he performed excision of the *uvula* for its relief. The truth is, that the whole membrane is in a morbid state, and the circulation in the vessels is so much deranged, that the slightest external cause of disorder induces most serious effects. Certain it is, that when the uvula is then elongated, very slight causes are followed by painful and uneasy fits of irritation in the larynx, with a sense of suffocation, and temporary extinction of the voice.

Dysphonia, or impaired and disordered voice, nevertheless, is a much more frequent concomitant of morbid states of the uvula and tonsils. According to the amount of disorder in these parts, it varies from severe hoarseness and painful utterance to the slightest degree of weak voice, in which protracted vocal exertion is followed only by increase of fatigue. All this evil Mr Yearsley ascribes principally to the agency of our variable and uncertain climate, in which changes of temperature and other noxious influences are so incessantly in operation. The superiority of the inhabitants of the south of Europe, in the qualities of strong, clear, and mellow voice, he thinks, is owing to the healthier condition of the throat and larynx, which a mild and steady climate ensures.

"Dysphonia," says Mr Yearsley, "is more common among persons engaged in public speaking than among others. When any morbid state of the throat is once established, any severe exercise of the voice is sure to occasion an aggravation of the complaint, so as to affect the voice. I have had opportunities of seeing, in the cases of clergymen, several fine voices quite broken up by throat disorder. How usual is it to hear of clergymen being obliged to suspend their duties on account of weakness of the voice? Observation has convinced me, that, in nine cases out of ten, the morbid state of the tonsils or uvula is the cause of the disorder. When the tonsils are enlarged, or the uvula is in an irritable state, the voice, even when least affected, becomes weak if exercised for a considerable length of time. The clear resonance of the natural voice is changed for a harsh and disagreeable tone. This deterioration is commonly known by the term *thick speech*; the voice cannot be understood at any thing like the natural distance; either there is an unpleasant drawl, or the words are mumbled together in a confused manner; the variations and flexibility of the voice, which add so much to its expression and harmony, become altered to an unvarying monotony. These are some of the consequences of enlarged tonsils, when they project from the palatine arches, or hang down towards the glottis. When the morbid growth extends upwards, and interferes with the motion of the soft palate, or encroaches on the cavities of the nose, the voice becomes nasal."

The occurrence of these enlargements at an early period of life, he further adds, when children first began to speak, exert a most injurious influence on the progress of speech. The child talks slowly, and cannot utter certain sounds and letters; the attempt to utter them, however strong, is rendered abortive by the state of the throat. Hence these sounds are passed over; and in this manner young persons often acquire in early life bad habits of speaking, which cannot be removed by the greatest care and pain in subsequent life. To the same cause also, operating on the organ of hearing, he ascribes the habit of stammering.

The effect of disease of the uvula and tonsils on the voice in singers he represents to be not less remarkable. The chief evil to vocalists is, that the compass of the voice becomes contracted and its richness is diminished. He has seen instances, some in professional singers, in which one, two, or even three notes were lost in consequence of disease of the uvula. Conversely, he found, that, by adopting the proper treatment, many of his patients regained notes to the amount now specified. Besides this loss in compass and volume, an irritable and elongated uvula greatly diminishes the length of time during which a singer can use his voice with full effect. The whole organ is enfeebled, and slight or ordinary exertions act on it more rapidly than were it of normal strength. Another result is irritative cough, the elongated uvula being sure to irritate the larynx and glottis in the upward movements of the latter while singing. Mr Yearsley states that he has known singers cough for half an hour after any considerable vocal exertion, so that they entertained serious thoughts of relinquishing their profession from the dread of pulmonary disease, when no other morbid symptoms existed, except elongation of the uvula and the consequent irritation of the part. During the existence of this form of throat disease, any considerable exertion of the voice is fraught with danger. Instances are recorded in which persons have, after singing requiring great physical effort, been attacked with fatal inflammation of the throat, or they have fallen victims to disease of more protracted character, originating, however, under the same circumstances.

The truth is, that the continuance of this irritation is most likely to induce chronic inflammation of the top of the larynx, and especially the glottis; and might also call into action the follicular disorder to be mentioned afterwards.

Mr Yearsley has much merit in directing attention to the facts now specified. But we think that he is forgetful of the maxim, to render to each his own, in claiming as his own exclusive property the discovery, that hypertrophy or elongation of the uvula may diminish the volume and compass of the voice. If Mr Yearsley will take the trouble to look at the account given of the researches of Signor Bennati on this subject, in the fortieth volume of this Journal,* he will find that the whole doctrine of the influence of the uvula and tonsils on the voice, especially in singers and soprano singers, was most perfectly understood and fully explained by that ingenious person. Mr Yearsley has nevertheless the merit of illustrating that doctrine with ability, and in an interesting manner.

The elongated uvula acts most on the larynx and glottis, and consequently induces cough and feeble or disordered voice. The enlarged tonsils, by contracting the passage, contribute to the same result. But they farther exert an effect peculiar to themselves from their close connection with the guttural end of the Eustachian tube. By blocking this up more or less, and by their size in impeding the communication of that tube with the throat, the whole effect of that communication, whatever it be, is more or less impaired, sometimes entirely annihilated. Some, as Kramer, have denied this effect. But it seems impossible to doubt, that a person in whom the tonsils are enlarged and otherwise diseased, does neither hear so well nor appreciate sounds so accurately, as one in whom the throat is in a state of health, and unincumbered with such morbid growths.

Mr Yearsley further observes, that the mere presence of these bodies causes, in the secretions of the throat, a great alteration, which acts hurtfully on the orifice of the tube; that otorrhœa he has been able distinctly to trace to enlargement of the tonsils; and that *tinnitus* and other forms of morbid hearing are not unusual results of this lesion.

It is said that occasionally in the affection of the throat ulceration does take place in the uvula, on its margins or its posterior surface, and sometimes on the surface of the hypertrophied tonsils. Doubtless these results may ensue in some cases; but they are not requisite in order to produce the effects on the voice now mentioned.

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* Edin. Med. and Surg. Journal, Vol. xl. pp. 166, 167—172. Edin. 1833.

Various remedial measures have been proposed for the alleviation or removal of these affections of the throat. They are essentially chronic, and require peculiar measures. But, hitherto, measures recommended have not by any means been always, or even in a majority of cases, successful.

Some looking on them as dependent on the state of the general health, and especially that of the alimentary canal, have recommended mostly the adoption of those measures, the employment of which tend to improve and corroborate the former, and amend all disorders in the latter. Unquestionably, this is a most important indication, and should not be neglected. Regulation of the diet, due evacuation of the bowels, the use of mild tonics, avoidance of cold, and all means of corroborating the general system, have been found of especial benefit. Even in certain cases, where the disorder is manifestly connected with a loaded state of the bowels and a congested condition of the vessels of the viscera, manifest improvement ensues on the use of a course of gentle but efficient laxatives. It is nevertheless possible to carry this doctrine too far; that is, laxatives may be used steadily and efficiently, and the disease not be entirely cured. Under such circumstances, the employment of tonics generally and locally is of material importance. But the tonics here meant, and required in such cases, are not so much the tonics of the pharmacopœia and laboratory, as breathing good air; residence in the country; the use of the sea-water-bath, first tepid and then cold; and the frequent, if not constant, use of cold water as drink. As to astringents, something may be done by their means; and nitrate of silver, especially, has been much and beneficially employed in the management of this disorder. But they cannot be used constantly, or continued sufficiently long to eradicate the disease. The best plan is to use them about two or three weeks for a time, then to give them up for three or four weeks, then to resume their use, and in this manner to induce some favourable change in the parts. Washing the exterior surface of the neck with cold water, in which some salt has been dissolved, is very useful in certain cases.

Hypertrophy of the tonsils in the strumous is the most difficult form of the disease to manage. Nitrate of silver has little effect; at least in the usual way in which it is applied. It touches little more than the surface of the tumour, leaving its substance unaffected. From his experience, Mr Yearsley attaches to it no importance, except in adult cases, where the growth is inconsiderable. Painting the morbid growths with tincture of iodine he regards as equally unavailing in reducing their size. He allows, nevertheless, that iodine in the form of ointment, rubbed over the surface of the neck, may be a more effectual remedy. An ointment, consisting of one grain of iodine, half a drachm of iodide of potassium, and one ounce of spermaceti ointment, is prepared, and of this a small quantity is directed to be rubbed, night and morning, along the lower and inner margins of the lower jaw, which is not far from the enlarged tonsils. Gargles are useful in keeping the parts free from unhealthy secretions. Alum in infusion of roses is the most convenient.

When all these means fail, which is often the case, the only alternative is excision or re-section, when it can be performed. This cannot be easily done in very young children; but in those grown up, and in adults, it is easily accomplished. This, also, should not be attempted in those cases in which the tonsils are enlarged from the use of mercury or any other cause of temporary operation. Neither is it proper to employ the argument, that the disease disappears as the digestive functions are improved, and the patient becomes stronger. This is doubtless the fact in a certain proportion of cases. But, in the meantime, the presence of these enlarged tonsils in the throat is liable to produce other evils, to aggravate every acute affection of the throat, and, above all, to prove a source of great danger to the patients, if attacked by scarlet fever or any other disorder affecting the throat and air-passages.

The operation is further easily performed, and always followed by the anticipated effects. The experience of Mr Yearsley, which extends to more than one thousand cases, has satisfied him of the advantages of operating when other means are unavailing.

In the treatment of elongated uvula, similar principles should be applied. When the disease is connected with chronic stomach ailment, this must be removed by appropriate measures; and then the most effectual remedy is the administration of the nitrate of silver, in doses of one-fourth of one grain. When, after the employment of all due means, the uvula continued elongated, and pendulous, and even heavy, removal by the knife is the most effectual remedy. For this purpose, Mr Yearsely employs a knife with a hawk-billed extremity, strong back, and placed at an angle with its handle. The operation itself is simple. The patient being properly seated opposite to a good light, the operator draws out the diseased tonsil from between the pillars of the *fauces* diagonally across the throat, and over the bridge thus formed he introduces the knife, held like a pen. As he cuts forwards towards himself, he keeps slightly dragging at the tenaculum, so that, when the excision is completed, the morbid growth, tenaculum, and knife, are all withdrawn together at the same moment.

For curing elongated uvula, Mr Yearsley recommends, not clipping or snipping across the tip of the uvula, but total excision, which alone, he says, is effectual. This is accomplished by the tenaculum and curved scissors.

Connected with these may be noticed another form of lesion affecting considerably the voice, hearing, and, in extreme cases, the expression. This is chronic thickening of the nasal membrane. This is most likely the effect of repeated attacks of inflammation in the strumous. In some instances, it is confined entirely to the mucous membrane lining the nasal cavities, especially their posterior recesses; but it may affect also the subjacent periosteum. Its effect is similar to that of diseased tonsils, yet more severe. Respiration through the nostrils is either difficult or impracticable, and the voice, though likewise marked by what is carelessly named the nasal sound, is peculiarly distorted. Hearing is often still more seriously affected, being much impaired; while the countenance acquires an expression of vacancy very characteristic. The membrane is probably affected with thickening into the Eustachian tube, or near its orifice.

For removing the evils now specified, Mr Yearsley employs, after many trials of other means, a probe or bougie, which he introduces into the nostrils, and by which he dilates or widens the passages. Other means, of course, he does not neglect, especially suitable medical treatment, and the use of the Eustachian tube catheter. If this probe be passed into the nostrils, once or twice a-day, it soon dilates the canal to such size, as to permit the passage of air to and fro; and it appears to exert a salutary influence on the tract of mucous membrane extending to the ear. In addition to this method of procedure, the author represents it to be of great moment in contributing to the full restoration of the membrane, that astringent lotions be injected through the nasal cavities to their posterior extremity, and, for this purpose, he recommends the use of an elastic gum-bottle, with a tube fitted to it.

Most commonly with, but sometimes without, the presence of the affection of the uvula and tonsils, the larynx may be the seat of a degree of chronic inflammation, affecting the mucous membrane alone, or that with its follicles. There is no doubt that the simple affection of the laryngeal mucous membrane, especially that which forms the upper and lower vocal chords, is adequate to produce, and often does produce, the peculiar infirmity of voice called clergyman's sore-throat. This inflammation is generally chronic, and it may, as has been already stated, be the effect of the elongated uvula, or it may exist without this. As to the former, the testimony of Mr Yearsley is distinct. But to that it is unnecessary to go. All medical practitioners, of any experience, must have seen instances of this species of vocal disorder. The testimony of Dr Mackness tends to establish the same conclusion. It is, in truth, a state of the glottis and its membrane, produced by over-exertion, while the laryngeal membrane is either positively irritated and inflamed, or while it is in that state of weakness and atony which ensues on inflammation, though slight.

A more serious and advanced stage of the malady is inflammation or inflammatory enlargement of the laryngeal follicles. This is an affection essentially chronic, and it appears either after repeated attacks of an acute nature, or comes on slowly and rather insidiously in persons obliged to exert the voice greatly, as a chronic disorder.

The following description of the early formation of the disease is given by Dr Green. It may be premised that we do not entirely agree with the views of this writer, who regards the public speaker's sore throat as consisting essentially, in the formative stage, of inflammation of the mucous follicles; subacute in character; and terminating in hypertrophy, ulceration, or induration of these follicles; or in the deposition of tubercular matter into their substance.

"In its simple and uncomplicated form, the affection commences invariably in the mucous follicles of the fauces and pharynx; and is extended thence by continuity to the *glandulae* of the epiglottis, larynx, and trachea; and in some instances to those of the œsophageal membrane."

"So insidious frequently is the onset of this disease, and so gradual its progress, that in some instances it will be found to have continued many months; and to have made considerable advance, before the presence of any prominent local symptom shall have called the attention of the individual to the existence of the affection. He then perhaps becomes aware of an uneasy sensation in the upper part of the throat, accompanied by a frequent inclination to swallow, as if some obstacle in the passage might be removed by the act of deglutition; or more frequently an attempt is made and often repeated to clear the throat by hawking; and to relieve it of a sensation of something sticking at the top of the windpipe. About the same time, there is observed an alteration in the quality or *timbre* of the voice; there is experienced in the vocal organs a loss of power, and hoarseness, which at first is hardly perceived, in the morning or after a full meal; but which is increased towards evening, and after speaking or reading, longer or louder than usual. The mucous secretion, which, in a healthy condition of the glands, is bland and transparent, becomes viscid, opake, and adherent; and is increased in quantity. Frequently slight soreness is felt about the region of the larynx, but seldom is any cough present at this stage of the disease. In this condition the symptoms may remain for a long period; sometimes for years; nearly disappearing at times; and again being greatly aggravated by vicissitudes of temperature, increased exercise of the vocal organs, and by various other morbific causes."

"If we inspect the throat during the progress of the above symptoms, we find the epithelium, which, in the healthy state of the mucous tissue, covers its surface, more or less destroyed; its absence being manifested by the slightly raw or granulated appearance which the membrane presents; the mucous follicles are found hypertrophied, and appear distinctly visible; especially those studding the upper and posterior part of the pharyngeal membrane. If the disease has been long continued, a portion of the follicles may be indurated, or, in some instances, filled with a yellowish substance having some resemblance to, and presenting the physical characters of tubercular matter; while striae of opaque adhesive mucus, or of a muco-purulent secretion, may be seen hanging from the veil of the palate, or coating the posterior wall of the pharynx. As the disease advances, and the follicles situate at the root of the epiglottis and in front of the arytenoid cartilage, and the still more numerous *glandulae* of the laryngeal mucous membrane, become involved in the morbid action, all the above symptoms appear greatly aggravated. The hoarseness is much increased, and is constant; speaking or reading aloud is attended with great difficulty; and when continued for any period is followed by pain and increased soreness in the region of the larynx; and by a sensation of extreme langour, not only about the vocal organs, but throughout the whole system. In some cases, where the disease affects the glands situate in the ventricles of the larynx and near the vocal chords, the voice becomes completely extinguished; or if, by great effort, the patient essays to speak aloud, the vocal resonance is uneven, harsh, and discordant."

"In such cases, notwithstanding the situation and extent of the disease, there is seldom any decided or troublesome cough; and in this respect, follicular disease differs essentially from all other equally severe laryngeal affections. Cases have repeatedly fallen under my observation, where the affection had advanced, until the symptoms present indicated extensive disease of the follicles of the larynx, and of the membrane covering the vocal ligaments, until the ulceration of these glands situate at the root of the epiglottis, could be felt, upon the laryngeal surface; and yet the patient remained free, or nearly free, from cough, notwithstanding an abundant acrid secretion poured out by the diseased follicles, occasioned incessant hawking to clear the upper part of the windpipe, and the pharynx of this tenacious mucus."—Pp. 50—53.

The author then describes, in illustration of the correctness of the general description, the particulars of four instances of the disease, three in clergymen, one in a lawyer,—all persons in whom the disease was either induced or greatly aggravated by the professional duties of the individuals. All these persons appear to have been under 40 years of age; one was 35, one 34, and another 38. It appears that this form of disorder is greatly more common, in clergymen especially, in the United States than in this country, or indeed than in any country in Europe.

The process now mentioned tends to cause, if it do not consist in enlargement of the mucous follicles. To this the author, we think, rather prematurely applies the name of hypertrophy, which, he says, is one of the earliest changes induced in disease of the pharyngo-laryngeal membrane, and which he conjoins with altered secretion, and a deposition of tubercular matter in the follicles. Probably it is disputing about a mere name to question the propriety of calling this enlargement hypertrophy. But we must continue to regard it as either one of the marks or characters of chronic or subacute inflammation, or so closely attending that process that it cannot be distinguished from it. It is in these follicles, as in other textures, and especially those of glandular structure. Inflammation causes swelling or enlargement, and its presence is known chiefly by this circumstance. The cause of this swelling is the distension of the vascular system of the follicles by blood, and the infiltration from these distended vessels of serum and sero-albuminous fluid. This, we conceive, is not hypertrophy, which is increased nutrition, properly speaking, but the effect of the orgasm and interrupted circulation taking place in chronic inflammation. The free membrane of the follicle consequently does not secrete its natural fluid, but a new and morbid product; and hence we admit in this disease the altered secretion which the author represents to be one of the effects.

The same admission, however, we cannot make as to the existence, in this stage of the disease, of tubercular matter in these follicles. That tubercular matter may be formed in them, is consistent only with what is known of the morbid changes incident to the glands in certain habits; and that it is formed in certain varieties of this disease, may be true. But it is not consistent with what is known either of follicular disease generally, or the deposit of tubercular matter in them to represent that deposit as an occurrence common and frequent. The peculiar caseous-like secretion found in these follicles and covering them is merely their natural secretion altered by disease, and rendered too viscid to be removed as rapidly as it is secreted. As soon as the chronic inflammation of the follicles themselves is removed, then this caseous-looking product ceases to be effused. This explanation will account for the following statement made by Dr Green.

"Hypertrophy is not always a morbid process, as it sometimes depends upon increased nutrition of the part; but the altered secretion and changed structure which attend this form of it, mark it as being united with disease, or as constituting in itself diseased action. Not only are the crypts of the fauces, pharynx, and air-passages enlarged in follicular disease; but, in many instances, the *lenticular papillæ,* those large mucous glands which are situate at the back of the tongue, just before the *foramen cæcum,* are found in an hypertrophied condition."

We doubt whether it can be received as a principle, that hypertrophy is not always a morbid process. It is a morbid process in the heart, the brain, the liver, the *mammæ*, and the testes. But whether it be so or not in all circumstances, the facts mentioned by the intelligent author prove simply, that the follicles are enlarged from chronic inflammation, and that this is in the early stage the pathological state of the pharyngo-laryngeal membrane.

Induration of the follicles is another change liable to take place in chronic inflammation. In some instances, it is attended with enlargement; in others, the follicles retain their natural size. This change in consistence, especially if attended by slight enlargement, renders the glands like small seeds or grains imbedded in the mucous membrane. It is not necessarily malignant, nor does it always proceed to ulceration. It depends partly on increased vascularity and distension of the vessels by blood, partly on the effusion of albuminous matter infiltrated into their filamentous tissue, and, on some instances, in the presence of a new secretion within the follicle. Indeed, the follicles then seem to resemble much the follicles of the skin, as that of the face, when enlarged and indurated, and often appear to secrete and contain a sort of viscid, suet-like matter, which is prepared by their morbid membrane. It is not necessary, therefore, in ordinary cases, to regard these follicles as skirrhous, as has been sometimes done. They may, indeed, in certain cases, become affected with skirrhous induration, but this takes place at a later period of life, and proceeds in a totally different manner, as it gives rise, in no long time, to the characteristic carkinomatous ulceration.

The enlargement, or chronic inflammation of the pharyngo-laryngeal follicles may terminate either in induration, as already stated, or in resolution, or in ulceration. In resolution, which is usually the result of treatment, the swelling of the gland undergoes gradual diminution, and the follicle returns to its natural size. It is not easy to ascertain the proportion of cases in which this ensues. It is probable, that, on the whole, it is not inconsiderable, since, if taken in proper time, and subjected to methodical and systematic treatment, a number of recoveries is effected. This is, it must be observed, a sort of proof, when recoveries are thus effected, that the disease has been caused by simple enlargement, and that it has not proceeded either to much induration or ulceration. Had it advanced to ulceration, either recovery must have been much later and more imperfect, or the disease must have terminated fatally; for such, we observe, is usually the result of ulceration in the laryngeal mucous membrane, and particularly when it affects the follicles.

It is not easy to draw the line of distinction between the mere stage of enlargement and that of ulceration of these glands, unless by looking to the respective terminations of each. Dr Green states, that the secretion of a fluid possessing all the sensible and chemical properties of purulent matter, is the frequent result of disease of the pharyngo-tracheal follicles. When the disease, he adds, has passed to the stage of ulceration, the purulent secretion is marked and abundant, and its smell is apparent. But this secretion, he allows, occurs where no structural lesion either of the follicles or of the lining membrane can be detected. Andral indeed, and various pathological writers, have recorded cases, in which a free purulent expectoration has continued for some time before death, and in which inspection after death disclosed no alteration of structure, or any other evidence whatever of inflammation having taken place during life.

Though we are unwilling to call in question the observing powers of the author, yet we must confess our inability to admit the correctness of the inference now stated. On the one hand, the matter of expectoration should have been examined under the microscope; and, on the other, the membrane should, after death, have been carefully examined under the same instrument; and we doubt not, that either it would have been proved that the expectoration contained no purulent globules, or if it did, that the membrane was inflamed, and secreting these globules. The *peritonaeum* in puerperal females is liable to a peculiar state, in which the ordinary and unaccustomed eye can detect neither purulent matter nor inflammation; and females who have died with most marked symptoms of an unmanageable disease of the uterine peritonaeum, have been asserted, in these circumstances, to have died of typhous fever, of nervous shock, of putrescence, of nothing; in short, of anything but puerperal and uterine *peritonitis.* The practised eye, however, can at once recognise both the marks of peritonitis and purulent matter, though of a thin, serous character; and microscopic observation immediately confirms the inference. Such, we cannot doubt, is the state of matters as to this question of the presence or absence of inflammation in the pharyngo-tracheal membrane, when the expectorated matter presents the purulent or puriform appearance.

All this, however, only tends to corroborate the view which we now take, that, in the majority of cases even of the dysphonia of clergymen, the follicles are only in a state of intumescence and irritation from chronic inflammation.

The disease, nevertheless, may and does proceed to ulceration; and we believe, that, in that state, recovery is by no means common, indeed is rather rare.

"In all cases of sub-acute inflammation of the mucous follicles, the tendency of the morbid action is to terminate ultimately in ulceration, although, as we have seen, these glands may remain in a state of hypertrophy, or induration, in some instances, for years, before this form of structural lesion shall occur. Ulcerations of the follicles of the air-tubes differ essentially in their appearances from those ulcerations of the mucous membrane, which are the frequent consequence of inflammation of that tissue. In the latter, when the result of chronic inflammation, the ulcer commences by destroying the epithelium, and then extending its circumference and depth, penetrates the mucous tissue, and appears in the form of a superficial ulceration, with irregular edges, and a rough, sloughy base.

" Ulcerations of the glandulæ are preceded by chronic inflammation and hypertrophy of these bodies, and, when thus engorged, the follicles appear like small points beneath the mucous membrane. If the irritation continues, infiltration of puriform or tubercular matter takes place within the cavities of the glands, by which the parietes are distended, and finally are ruptured, and they are then seen in the form of small reddish elevations, with irregular hardened edges, and having central ulcerations, which often extend into the sub-mucous cellular tissue."—Pp. 68, 69.

" The observation has already been made," says Dr Green, " that, in all cases of long-continued chronic irritation of the mucous glandulæ, there exists a tendency, in the morbid action, to terminate ultimately in ulceration. Ulceration is always preceded by some degree of inflammation; but irritation, and engorgement of the cryptæ, may continue for a long time, in many cases, before the occurrence of that process,—a solution of continuity with suppuration,—which constitutes true ulceration. In other cases, after the irritation has persisted for some time, the engorged follicle presents a small ash-coloured point, which is surrounded by an inflamed base, and has red and slightly-elevated edges. In follicular disease, these ulcers, which ordinarily spread slowly, are generally first observed about the arches of the palate, and on the back of the pharynx; they next attack the laryngeal face of the epiglottis and the epiglotic glands, situated at the base of this cartilage, and, spreading by continuity, they, in some instances, invade the mucous follicles in the ventricles, and around the chordæ vocales. Indeed, there is no part of the larynx and trachea that may not be the seat of ulceration.

" In their early stages, ulcerations of the mucous glandulæ are small and superficial; continuing for a long time, not only are the glands destroyed, but the mucous, the sub-cellular tissues, and even the cartilages themselves, may become involved in the ulcerative process.

" Intimately connected with the pathology of this disease, are those morbid conditions of the mucous membrane, which, sooner or later, occur to some extent in all forms of follicular disease. One of the earliest and most common alterations which take place in the mucous linings of the air-passages in the early stage of follicular disease, is an increase in their thickness. Invited by the chronic irritation which has been set up in the diseased follicles, there is, at first, an additional quantity of blood received into the contiguous mucous and sub-mucous cellular tissues. This is followed by an infiltration of serum within the substance of these tissues, by which interstitial deposition they are rendered swollen and pulpy.

"In the more chronic and long-continued form of inflammation, an interstitial infiltration of lymph sometimes takes place, which renders the mucous lining more dense, and constitutes the true hypertrophy of this membrane.

"In almost all cases of follicular disease, however, there occurs, eventually, an opposite condition of things from the above; for, after the affected glands have poured out their increased and vitiated secretion for a long time, not only are the surrounding engorged membranes unloaded, and their increased thickness removed, but the sub-cellular tissues and the pharyngeal muscles become atrophied, in part, probably from the increased absorption which has been set up, and we then have, on inspection, those enlarged or cavernous throats so frequently observable in long-continued follicular disease, and to which allusion has more than once been made."—Pp. 154–157.

The same author allows, that this is the state most generally productive of purulent secretion.

A third change to which the pharyngo-tracheal follicles, according to the representation of Dr Green, are liable, is that of tubercular infiltration. The author is manifestly rather solicitous to establish this fact, and he has been at considerable pains to do so. To us, however, it appears that the evidence amounts merely to the inference, that tubercular infiltration may take place in these follicles as it does in other tissues of the animal body, not to the proposition that it is either a frequent or common state of the pharyngo-tracheal membrane in affections of the voice. We do not deny the occurrence of tubercular disease in these follicles. All that we think can be said is, that it is neither a common nor frequent state of the throat in the usual lesions of that organ. All this, nevertheless, must resolve itself into a question of individual experience in the United States and in European countries. Tubercular disease of the follicles may be an affection not uncommon in the United States. In European countries, and certainly in Great Britain, though not unknown, it is not very common. At this conclusion also we observe Dr Mackness arrives. Not only does he doubt, as we have ventured to do, the frequency of follicular disease, properly so called, as the cause of the *dysphonia* of public speakers and clergymen, but he also questions the termination in tubercular infiltration. He allows, however, that the latter may, as follicular disease, be a more common disorder in the United States than in European countries.

If we appeal to the usual test in order to determine the point, and inquire in how many instances of actual tubercular disease of the lungs, the follicles of the larynx and trachea are also affected, we find that the answer is decidedly against the inference made by Dr Green. According to the researches of Louis, the proportion of cases in which the larynx and trachea are affected with tubercular disease is extremely small. According to those who follow Louis, in one hundred cases of phthisis the mucous membrane of the larynx and trachea was tubercular in about one-twentieth. This is certainly not a large proportion in diseases causing tubercular deposition in various organs. In general we have observed, in the course of practice at a large hospital, that even in cases of tubercular destruction of the lungs, and in which the voice was affected, or uneasiness in the larynx was the subject of complaint, the follicles presented minute ulcers in a very small proportion of cases, about eight or nine in one hundred cases. In others the membrane was only reddened. No tubercular disease was manifest.

Conversely, we have observed a number of instances of chronic inflammation and ulceration of the larynx, and several of ulceration of the trachea. But these were unattended with tubercular disease. They were not causes of the *dysphonia* of speakers and clergymen, and they proceeded from totally different causes, being in general occasioned by the frequent use of mercury.

We have yet to observe, that there are cases of this infirmity of voice in which no sufficient, or perceptibly sufficient, lesion of the pharyngo-tracheal membrane can be detected, and in which, there is strong reason to believe, so far as information hitherto goes, that none exists. In a certain class of persons the voice becomes feeble; and, when it is exerted, or attempted to be exerted, it becomes harsh, husky, and finally extinct. This occurs mostly after fatigue. It is at first not a permanent affection. But after coming on several times, especially if the voice be much exerted, it is liable to become permanent.

This form of dysphonia appears to be very much a nervous affection; that is, it is connected with some weak, irritable state of the pharyngo-laryngeal membrane and the muscles, in consequence of some disordered state of the laryngeal nerves. In various instances it seems connected with gastric disorder, and then the ailment is partly owing to weakness of the larynx, as part of the general weakness, and partly to an enfeebled state of the inferior laryngeal nerves and the pharyngeal nerves, in consequence of irritation caused to the eighth pair. That this is the fact may be inferred from the circumstance, that patients affected with this form of *dysphonia* recover, in proportion as they regain strength and as the functions of the stomach are improved.

The voice is also liable to this sort of failure in hysterical females, and in persons afflicted with epilepsy. It is difficult to say whether the membrane here suffers, the nerves, or the muscles; probably all in some degree. We have seen, after an attack of epilepsy, the voice become extinct in this manner for several days, and only return slowly after the application of a blister round the neck.

In the third place, the pressure of tumours either on the *trachea* or on the *larynx* is a cause not unfrequent of hoarseness and harshness of the voice, and sometimes of *dysphonia* or *aphonia.* The most usual are aneurisms of the *innominata* or the carotid artery. In a female between 25 and 30 years, who had been long suffering under *dysphonia*, in whom the voice was unequal, husky, hoarse, and whispering, death took place rather suddenly. She was in her usual state between three and four P.M., and died almost instantly between seven and eight in the evening. Upon inspecting the body, it was found that an aneurismal tumour had been formed in the left common carotid artery, and that this tumour had compressed at once the left side of the trachea and larynx, and the trunk of the eighth pair and the recurrents of that side. Death in this case appeared to be caused by suffocation, in consequence of the tumour compressing the nerves of the left side of the larynx, and allowing the glottis to be paralysed and the rima glottidis to be closed. It is probable, also, that the pressure of the tumour on the larynx at that point may have concurred in forwarding the fatal result.

A man, who had general *periostitis*, suffered also under symptoms which were believed to denote the presence of chronic *laryngitis.* The voice was harsh, husky, and feeble; often he could not speak; he had a harsh ringing cough; and occasionally he presented symptoms of crowing inspiration, which could be heard in the adjoining apartment. In one of these fits he became particularly distressed. The breathing was difficult and laborious. He could not lie down. The crowing inspiration was loud and most painful to hear. The physician, under whose hand he was, regarded the case as one of chronic laryngitis, and directed the operation of tracheotomy to be performed. The operation was performed with great dexterity and promptitude by an eminent surgeon. But the man's heart had ceased to beat before it was completed. It was found that a considerable aneurismal tumour had been formed in the course of the *innominata;* that this had compressed the trachea, and the eighth pair, and the recurrent branches; that in the latter it had caused softening; and that the larynx was free from disease. Death appeared in this case to be occasioned by paralysis of the arytenoid muscles, causing the collapse of the *glottis*, and closure of the *rima glottidis.* These results were, in all probability, aided by the effort made to endure the operation, and by the apprehension of the patient, while he was undergoing it.

A man was heard in the ward of a public hospital breathing with loud crowing inspiration, and as if he were either labouring under croup, or struggling for breath in a fit of violent asthma. The physician enquired what was the nature of the case, and when the patient had been brought in. The answer was, that it was believed to be a case of chronic *laryngitis.* The physician, not satisfied, examined the patient himself, desired him to uncover his chest and neck. He then showed that an aneurism had been formed in the *innominata,* and had risen so much as to form not only a slight though perceptible tumour above the right collar bone, but that it was rising and pushing forward that bone, so as to make it evidently more prominent than that of the left side. The man complained much of pains in the right side of the neck and head, which were owing to two causes. The interior of the aorta, innominata, and right carotid was in a state of inflammation; and the aneurismal tumour was compressing various nerves about the lower part of the neck, especially the phrenic. This man was much relieved by the application of leeches over the right side of the head and neck, and by other medical treatment. He died, however, after some weeks, chiefly with symptoms of suffocation. It was found that the tumour had compressed the *trachea* and right *bronchus,* so much as to cause perceptible flattening in both. The bronchial tubes of the right side were much filled with mucus, and dilated below the site of the aneurismal tumour. The larynx was healthy.

These cases, and they might be increased by the addition of more, did our limits permit, show clearly that the voice is liable to become weak, unequal, husky, hoarse, and altogether extinct, from causes not seated in the laryngeal membrane, but in other organs and operating on it, though it be void of organic changes. In short, we think that all physicians of experience must admit, that the voice, in certain cases of *dysphonia,* is rendered feeble and may become extinct, or at least equivalent to extinct, in certain states of the general health, certain disordered states of the digestive functions, and certain conditions of the nervous system. Such also is the result of the experience of Dr Mackness.

> "What is commonly understood by clergyman's sore-throat, in this country, is frequently an affection of a much milder character than that described by Dr Green. Many cases have their rise in sources hereafter to be mentioned, run their course, and issue either in recovery or become chronic, without exhibiting any special affection of the mucous follicles, and without any infiltration or tuberculous deposit taking place in them."

These peculiar sources shall be noticed forthwith, when we come to speak of causes to which this disorder is ascribed. It is sufficient to say, that by far the great majority of cases of the disorder in this country, are connected with some disordered stateof the health, and with dyspeptic symptoms; and that, though the uvula and tonsils may be not quite healthy, yet the complaint is essentially one of a nervous character, so far as the larynx itself is concerned, and is not necessarily dependent either on inflammation of the laryngeal mucous membrane or on that of its follicles. It is, indeed, a disease rather of irritation than of inflammation. We allow that this irritative state of the laryngeal mucous membrane, especially of the glottis and the follicles, may proceed, in the course of time, to inflammation, and probably to ulceration. But, again, we observe, that these are neither necessary nor uniform adjuncts orpathological causes of the clergyman's infirm voice, at least in this country.

Etiology.—The subject of causes is difficult, not only in itself but from the different views as to the pathological cause and essence of the disorder entertained by different authors. In the following observations, having already said so much in order to determine and illustrate the nature of the pathological and proximate cause, we confine attention chiefly to the examination of remote and predisponent causes, and immediate or exciting. It must be allowed, however, that in this disease, as in many others, the agent that at one time, and in one combination of circumstances, is merely a remote cause, becomes afterwards, and under other circumstances, an existing cause.

One of the most important remote or predisponent causes is, according to Dr Green, hereditary disposition or family peculiarity. That there is in certain families a hereditary tendency to follicular disease, he thinks a well-established fact. At the time at which he published his work, he had under his care three brothers, all clergymen, who had been compelled to relinquish their professional duties on account of follicular disease of the throat; and whose mother, then above eighty years of age, was labouring under the same disorder. In another instance, four members of the same family, with one of the parents, were the subjects of follicular disease; and among the notes of the author are recorded a large number of cases in which two or three members of the same family have been treated for this infirmity.

The strumous diathesis is next allowed to be a cause of great and powerful influence in inducing this disorder; and the mode in which it is brought into activity, he thinks, is by the agency of impure air. Public speakers, lecturers, clergymen, and similar professional persons, are compelled to exert their voice, for periods of some duration, amidst an air impure, and often vitiated to a great degree. It is not unimportant to observe, that while, on the one hand, all muscular exertion is comparatively easy in pure, fresh air, and very difficult in impure and vitiated air, yet the individuals are in this instance obliged to make not only great but long-continued efforts, in situations in which the vitiated air renders the muscles every moment less equal to the task imposed on them, while the individuals making efforts beyond the natural powers of the organs necessarily strain them, and thus throw them into that irritable state favourable to, if not constituting, disease. It is very much the case of a man obliged to make by his limbs violent muscular efforts, while the air which he breathes is of an impure and vitiated quality.

Climate exerts evidently great influence. Dr Green thinks that cold, and especially the cold moist atmosphere of a northern climate, operates as a powerful agent. To illustrate the influence of this cause, he observes that follicular disease of the pharyngo-tracheal membrane first made its appearance in the United States and New England; and that it has occurred most frequently, and has proved most severe, in the cold and northern states of the Union. For several years after the attention of the profession in the north had been called to the frequent occurrence and the severe character of the disorder, it was not admitted that the affection existed or was known in the south.

This exemption from the disease in the Southern provinces, he allows, is no longer observed. Some of the most severe cases of follicular disease which came under his observation during the years 1844, 1845, 1846, were in persons coming from the most southern states; and he has been informed by intelligent patients from New Orleans that cases of throat infirmity are very abundant in that city.

This statement, taken along with the view which the author has adopted as to the pathological cause of the *dysphonia*, throws a new light upon the subject, and explains, in some degree, the discordances in doctrine regarding this disorder and its causes in America and in Europe. The truth is, that it is here not at all doubtful, that one of the main causes of the disease is telluric *miasma* or malaria, and that this agent acts at once as a predisponent and an exciting cause. In forming this inference from the statements made by Dr Green, we observe that the cold or moist atmosphere of the northern states cannot be alone the cause of this follicular disease; since, were this the fact, then the northern countries of Europe, as Norway, Sweden, Denmark, and Russia and the north of Germany, as well as Great Britain, ought to be equally productive of the disorder. This, however, is not the fact; and, therefore, it must be inferred that neither a cold moist climate alone, nor a cold dry climate alone, produces either the disposition to the distemper, or the distemper itself. The only cause, which is common to the whole United States, the southern as well as the northern, is malaria, and from the fact of the alleged prevalence of the infirmity in the great emporium of the Mississippi, the abode of wet houses, and the place of wet graves, it is manifest that malaria does exert a very considerable influence.

Other anomalies likewise this inference tends to explain. Granting to Dr Green that follicular disease is so frequent as he represents it to be, and so often a cause of the throat infirmity as he states, we can understand that this may be the case in regions, where malaria prevails so extensively and so actively. There is no doubt that malaria causes follicular disease of the intestinal tube; for that this, and not the typhous or typhoid poison, is the genuine cause of intestinal fever, has been proved over and over again in this Journal, in opposition to all the bold assertions, that have been advanced by various authors during the last sixteen or seventeen years. While, therefore, this agent causes follicular disease of the intestinal mucous membrane, with the symptoms, not of typhus or typhoid fever, as has been erroneously represented, but of the remittent-continuous fever, it is by no means wonderful to find that it causes, in another part of the alimentary canal, and an adjoining part of the respiratory mucous membrane, the same morbid effects in the follicles of these membranes. It is in truth an agent applied most extensively over all the mucous membrane, by far the most constantly and directly over the pharyngo-tracheal membrane, and that it should cause this enlargement and chronic inflammation of the follicles of this membrane is so far from being wonderful, that it seems to be in the ordinary course of events, and would be wonderful if it did not cause some evil of this kind.

Other causes, nevertheless, concur with those now specified to produce this malady, at least in the United States; and probably these causes operate not less powerfully in this country, though not in giving rise to follicular disease. These causes are, debility from dyspeptic disorders, produced or aggravated by excessive duty, protracted mental labour, with great mental anxiety, and all those circumstances that tend to render the life of a conscientious clergyman, not over-paid, or with a scanty income, any thing but a life of ease, comfort, and independence.

"Few causes," says Dr Green, "tend more powerfully to depress the vital energies, to weaken the nervous system, and dispose the organs to take on the action of disease, than mental inquietude united with intense application to study. To this cause of disease it is that many of the clergy of our country are exposed; and it is for this reason, among others, that so large a proportion of clerical men, in comparison with those of other professions, are affected with follicular laryngitis. In these remarks I refer not to that portion of the clergy who, located in our cities and large towns, receive, many of them, ample remuneration for their ministerial labours, but to that more numerous class who, settled in the towns and villages of the country, are compelled to sustain themselves and their families on salaries which, with the practising of most rigid economy, are barely adequate to supply them with the necessaries of life."—Pp. 162, 163.

Among exciting causes, Dr Green enumerates influenza, dyspepsia, eruptive fevers, exercise of the voice, especially when excessive and protracted, and the use of tobacco. On the operation of these agents, the effect of all of which is obvious enough, it is unnecessary to dwell.

We shall merely advert to two causes well noticed by Dr Mackness. One may be denominated the exercise of the voice alone in feeble and delicate persons, and without due exercise of the other muscles. The second may be regarded as the speaking in some sense in an unnatural and artificial voice.

On the first subject we do not propose to do any thing else than quote from Dr Mackness the following passage, in which a gentleman of the legal profession gave his opinion as to the reason of the greater prevalence of infirmities of voice among clergymen than among barristers.

> "Your objection as regards barristers not being equally liable to this disease, I will answer, by saying, that, as regards numbers, they certainly do not suffer in the same proportion as clergymen, and I have had, perhaps, an opportunity of forming a correct opinion, from the circumstance of having been long and intimately acquainted with many eminent men in the legal profession; this has tended to bring my mind to a comparison of the disease in question acting upon both these professions, and the causes of that difference in number between each of the two classes, I think may be explained in the following way.
>
> "In any given number of young men about to start in their professional career, no particular choice may have been made, in the first instance, as to their several fitness for the peculiar actions they may have to perform; but it generally happens, that, should there be any deficiency in health, or other physical obstructing cause, or doubt of the capability of the youth thus ready prepared to take the field, the universal cry is, 'Oh! I don't think, poor fellow, that he will be fit or strong enough for anything but the church.' Now, I do not mean this observation to relate to mental deficiencies or qualifications, but entirely to the state of the health and bodily powers, bearing out my theory as to *numerical corporeal disabilities.* Whether a young man thus placed happens to have a good resonant voice, with a glottis that may be most enduring of action, is never dreamed or even thought of; it is quite sufficient that he has not

strength for any laborious profession, and in the kindness of his friends, and their best wishes for his welfare, he is sent into the church, perhaps with a most dangerous predisposition to disease, and, if he should be lucky enough to get preferment, *nolens volens* preach he must, and the very efforts which are necessary for his daily support, and to preserve his life and guard against danger, conduce mainly to a state of lingering wretchedness and disease, if not to death.

" It is thus evident, that, in any given number of men brought up to the church and the bar, many, nay, most of the churchmen so brought up, must not be considered physically as the *élite,* or choice specimens fitted for any other active professional avocation, where health, strength, and endurance may be requisite on all and every occasion ; but, as I said before, '*I must make my dear boy a parson, for his health will not admit of any other profession.*' Now, I feel assured, that the predisposition to this frequently-occurring disease in the clergy may be traced to this original source. For, whether he has good and sustaining vocal powers, or whether these organs are weak and imperfect, the clergyman must go on plodding in the same course as long as he lives, and that often without much of the *vis animi* as a protecting agent. Not so the barrister,—none of this class can shine but those who have by nature a fluency of speech, arising from the free and healthy use of their vocal organs. Should they not possess this powerful and healthy advantage, they fail to rise or become known by the due calling forth of their boasted triumphs. We may hear of the fine healthy state of the pugilist or athlete compared with the generality of other persons, but it is only of those who possess these powers from nature that we do hear. And it is the powerful and enduring speech of the barrister also which can alone give him fame ; for many of this tribe, indeed, are only brief in discourse, for briefless are their hands, and, consequently, no demand is made on their vocal capabilities ; and even with them many a jewel shines unseen, in consequence of the want of the proper organs for bringing forth his latent powers."—Pp. 26, 27.

On the effect of speaking in tones, to which the voice is not naturally accustomed, the following statement from an eminent tragic performer may be given.

" Relaxed throat is usually caused," says Mr Macready, " not so much by exercising the organ, as by the kind of exercise, that is, not so much by long or loud speaking as by speaking in a *feigned* voice. I am not sure that I shall be understood in this statement, but there is not one person in, I may say ten thousand, who, in addressing a body of people, does so in his natural voice, and this habit is more especially observable in the pulpit. I believe that relaxation of the throat results from violent efforts in these affected tones, and that severe irritation, and often ulceration, is the consequence. The labour of a whole day's duty in a church is nothing, in point of labour, compared with the performance of one of Shakspeare's leading characters, nor, I should suppose, with any of the very great displays made by our leading statesmen in the Houses of Parliament. I am confident as to the first, and feel very certain that the disorder which you designate as the clergyman's sore-throat is attributable, generally, to the mode of speaking, and not to the length of time or violence of effort that may be employed. I have known several of my former contemporaries on the stage suffer from sore-throat, but I do not think, among those eminent in their art, that it could be regarded as a prevalent disease."—Pp. 35, 36.

Though the first of these extracts does not expressly mention, it manifestly implies, the existence and operation of the great cause of the infirmity of the irritated throat. It shows, that in persons who are not very robust or strong otherwise, when one organ is compelled to exert itself beyond its powers, that organ is sure to suffer; that in persons in whom the muscular system generally is not only not exercised but permitted to fall into a state of inaction and consequent debility, it is unreasonable to expect that a part exercised to its greatest capacity, or beyond its powers, should remain in strength and energy; and while such persons are engaged in pursuits, which tend to enfeeble their general health, and especially the energy of their muscular system, and to favour irregular determinations of blood, while no adequate pains are taken to improve and confirm the state of that health, the weight of evil falls on that organ which is subjected to the greatest efforts, and the longest continued and most fatiguing duties.

The symptoms of this disease vary according to the different forms and stages in which it is. All forms and stages agree in the feebleness, huskiness, and hoarseness or extinction of the voice. In some instances little or no inconvenience beyond this is at first felt. The most common symptom, however, after some time is a sensation obliging the patient to hawk and expectorate, and a frequent desire to swallow, in order to abate or allay the feeling of irritation.

In genuine follicular disease the most usual feeling is that of a foreign body like a seed or some similar object sticking in the throat. In the case of the Rev. Edward Irving, who was attacked by this disorder, and died of it, this was the most constant and uniform complaint of the patient. This painful sensation is commonly confined to one definite spot. In other instances the sensation is that of rawness and extreme tenderness, as if the cutaneous and epithelial covering were torn off the throat and larynx. This sensation, however, is not confined to the follicular form of the disorder, but may affect the patient in the milder and more diffused forms.

The description given by Dr Green in the following passage applies to the follicular disease.

"About the same time, if the patient be accustomed to employ the voice in public speaking, or in singing, there is apparent, to a greater or less extent, a loss of power in the vocal organs; uneasiness in the larynx, with sometimes pain on pressure. Hoarseness is also present, which may be slight in the morning, or altogether absent, but which is increased towards evening, and after speaking longer or louder than usual.

"On inspecting the throat, the fauces and the posterior wall of the pharynx will appear redder than natural; and the mucous membrane covering these parts will be deprived of its epithelium, injected, and studded over with enlarged mucous follicles. Sometimes, if the disease is recent, these glands will appear quite minute, and will be distinctly apparent only when the pharyngeal cavity is exposed to a full light. In other instances, they will have attained a size sufficient to give a rough or granular appearance to the whole surface of the fauces; while the viscid, tenacious mucus which is poured out by these follicles in their morbid state may be seen coating the membrane, or appearing in patches, or marking its surface with white or yellowish-white striæ.

"In some cases, several of the enlarged and morbid cryptæ will become confluent, and uniting, form angry-looking tubercles, of the size of a split pea, which may be seen on the posterior wall of the pharynx.

"In others, again, a deposition of textural matter takes place, and the follicle becomes indurated and permanently enlarged; or it may be distended with pus, or with a morbid secretion which will exhibit all the physical properties of tuberculous matter.

"If the affection has continued for some time, we shall frequently find some of the diseased follicles in an ulcerated state; these are generally first observed about the palatine arch, the posterior wall of the pharynx, and along the border, and on the laryngeal face of the epiglottis. In the first stage these ulcers are small and superficial,—appearing in the form of ash-coloured patches, surrounded by an inflamed and slightly-elevated base. Continuing, they at length destroy the mucous follicles; and sometimes involve not only the mucous, but the sub-cellular tissues, in their progress.

"Accompanying the above symptoms, there is often found œdema and elongation of the uvula; and, in many instances, hypertrophy of the tonsils.

"If the patient be exempt from all hereditary, phthisical tendencies, these symptoms may continue for years without making any decided progress. At times the unhealthy appearances will be nearly altogether absent, and will return again whenever the individual is exposed to any of the ordinary exciting causes. Some cases have come under my care, in which the disease—its symptoms alternating in this way—has continued for fifteen or twenty years; affecting only the follicles of the lining membrane of the air-passages; but in other instances, where the disease had not been in progress as many months, yet, where a strumous diathesis existed, I have found the lungs in this period irremediably affected; although the disorder was entirely local in its origin, and had been limited in its incipiency to the pharyngo-laryngeal cryptæ."—Pp. 179–181.

"In the incipient stage of follicular laryngitis, of the uncomplicated form, there is seldom much cough present. The irritation that is felt in the larynx, and which is caused by the increased and vitiated secretion from the diseased follicles, is generally relieved for the moment, by hawking, in this stage of the affection. As the disease advances, however, and the glandulæ of the larynx and trachea become involved in the morbid action, a cough will steal on, which, from being slight at first, is at length severe, and, in most cases, is attended by a free, tenacious expectoration.

"In this respect, the cough, which arises in follicular disease, differs from that which occurs in the early stages of tubercular affection of the lungs. In the latter, the cough will frequently continue for months, without any expectoration; or, if expectoration should occur, it will consist only of a trifling amount of transparent, frothy fluid.

"In another respect, these two diseases are essentially different. That peculiar, mental condition, incident to pulmonary disease,—by which the spirits of the patient are buoyed up, and hope often continues bright to the last,—is well known. The reverse of this obtains in follicular, laryngeal disease. In this latter affection, *mental depression* is, to some extent, so universally present, particularly where the affection has been protracted, that I have been led almost to consider it a characteristic of the disease.

"If the disease is not arrested until ulceration of the follicles of the larynx and trachea occurs, a manifest influence is exerted, by this lesion, on the nature of the cough; it becomes greatly aggravated, and is, more or less, paroxysmal. It has, if the structural change is extensive, a peculiar cracked or whistling character; and is attended, moreover, by considerable soreness in the region of the os hyoides. The effects produced upon the intonation of the voice, are, likewise, very apparent; but they differ materially, according to the seat and extent of the disease. If the ulcerations are confined to the follicles about the tonsils, the veil of the palate, and the pharyngeal membrane, the timbre of the voice is not, ordinarily, much changed; incomplete disphony sometimes exists; or, in other words, the sounds are merely obscured, or imperfectly articulated. But let the ulcerations extend below the epiglottis, and the hoarseness is greatly increased; the voice loses its power; and should the mucous glands within the ventricles, and around the vocal chords, become involved in the morbid alteration, it is reduced to a state of complete aphonia, and a harsh whisper, which is merely an articulation of the ordinary respiration, alone remains."—Pp. 183–185.

In examining the throat, or rather the larynx, in order to ascertain its condition, it is of great moment to employ the speculum contrived by Mr Avery of the Charing Cross Hospital, by means of which the observer is enabled to behold the condition of the epiglottis, glottis, and part of the larynx.

On the subject of treatment we must not dwell long; and indeed the procedure recommended especially by Dr Green, excludes in a great measure all sorts of remedies but one. Of course it is of moment to improve the general health, when that is out of order. All the usual local remedies commonly recommended for the treatment of laryngeal affections, as local depletion and the use of counter-irritants, he represents to be of little or rather no avail. And in the employment of gargles and remedies applied by inhalation and fumigation he appears to have as little confidence. The great remedy, which Dr Green, after many trials by means of other agents, finds to be so successful as to render any other unnecessary, is the local application to the laryngo-pharyngeal membrane of the crystallized nitrate of silver, not the fused nitrate, which he thinks is less likely to be quite pure.

The crystals of this metallic salt are, when pure, transparent, white, and nearly colourless, and completely soluble in distilled water. A solution of the strength of from two to four drachms of the salt in one ounce of distilled water, when applied freely to the mucous membrane, does not cauterize that membrane, but coagulating the albumen and other secretions of the mucous lining, forms a covering which defends the living tissue from the caustic action of the salt, when it operates in producing a most favourable change in the vital actions of the part.

The usual strength which Dr Green employs, is a solution of from two to four scruples of the nitrate in one ounce of distilled water. This he applies by means of an instrument consisting of whale-bone, about ten inches long, curved at one end, and to which is securely attached a small round piece of fine sponge. An iron or copper rod, like an ordinary urethra sound, it appears, would answer better, as it would more readily retain the curvature.

> " The instrument being prepared, and the patient's mouth opened wide, and his tongue depressed, the sponge is dipped into the solution to be applied, and being carried over the top of the epiglottis, and on the laryngeal face of this cartilage, is suddenly pressed downwards and forwards, through the aperture of the glottis, into the laryngeal cavity.
>
> " This operation is followed by a momentary spasm of the glottis, by which the fluid is discharged from the sponge, and is brought into immediate contact with the diseased surface.
>
> " Every physician who has been present when this operation has been performed (and a large number have witnessed it from time to time), has manifested much surprise on observing how little irritation has been produced by the introduction of the sponge.
>
> " If the patient, on opening his mouth, take a full inspiration,

and then be directed to breathe gently out, at the moment in which the sponge is introduced, the irritation caused by the application will be much less, than when this caution is not observed. The fact, indeed, has been fully established, by repeated experiments, that the introduction into the larynx of a sponge, saturated with a solution of the crystals of nitrate of silver, of the strength of forty, fifty, or even sixty grains of the salt to the ounce of water, does not produce, ordinarily, as much disturbance as is caused by the accidental imbibition, into this cavity, of a few drops of tea, or even of pure water."—Pp. 200, 201.

Some persons have expressed doubts whether it is possible, in this manner, to apply liquid remedies to the interior of the larynx, and especially to the glottis; and they have asserted that any attempt to do so must occasion irritation so violent, that it would be impossible to complete the operation. Something of this kind the application certainly does cause; but this passes off; and in no long time there is felt only the sensation as if some change had been accomplished within the throat.

This is the appropriate and effective remedy for the alleviation and removal of follicular disease. The same metallic salt also forms a good and useful remedy for the affection of the throat, as it appears in this country. At the same time, as we do not believe that all cases require this treatment, we think that milder measures may often be sufficient. The most important of all is repose of the organ, perfect rest until it recovers from its weakened state, and while all means are adopted in order to give strength to the system at large and the various mucous surfaces. On this subject Dr Mackness makes various judicious observations, which may be justly recommended to the attention of the reader.

PART III.

MEDICAL INTELLIGENCE.

I. PATHOLOGICAL ANATOMY.

Instance of Double Aorta, or Aorta with Double Canal; with aneurismal tumour and cretaceous degeneration of one of the two canals, and general hypertrophy of the heart. By M. BOUILLAUD. (*Archives Generales, 4ieme serie, T.* xv. 1847, *ou T.* 75, *et Union Medicale, August* 1847.)—A man, aged 36, a founder, was admitted to the Hospital La Charité on the 4th March 1847. He had been unwell for twelve months, and had felt, in consequence of a considerable effort, acute pain at the inferior and anterior part of the chest, with fits of coughing, and oppression. Subsequently he had strong beatings of the heart. On the 25th of April, his state was the following. The figure was still plump; the complexion pale, no œdema, good appetite, no diarrhœa, respiration natural, no breathlessness or palpitations in the state of rest. Dulness on percussion towards the precordial region to the extent of fourteen centimetres, = five inches and a half, vertically; and the apex of the heart corresponding to the sixth intercostal space, beyond a vertical line, proceeding from the left nipple. The precordial region, agitated by a twofold movement of elevation and depression, corresponding to the systole, the ventricular diastole; a twofold movement equally perceptible to sight and touch. Impulse of the heart regular, and manifestly increased in force. The twofold valvular clicking in great part masked by a double blowing rough rasping sound: the second sound or clicking of the heart more distinct than the first, and distinctly parchment-like. Very distinct arching in the region of the right breast, extending upwards and outwards, to the superior internal margin of the axilla, nearly to the level of the upper margin of the third rib, and downwards to the fifth and sixth ribs, to two centimetres beyond the site of the nipple; dulness very marked in the whole of this space, which was eleven centimetres, = four inches and one-third vertically; and thirteen centimetres, = 5 $\frac{1}{10}$ inches, transversely. In the same point double pulsation; twofold movements of elevation and depression, the first of which coincided with the ventricular systole, the second with the diastole. In the whole extent of the arching, very strong bellows sound, large, diffused, rough, like the noise made by currying a horse, and without admixture of any clicking sound. On the region of the tumour deep vibratory thrilling, isochronous with the diastole of the aorta and the ventricular systole, more marked in the upper half than in the lower half of the arched space. Similar thrilling on the superior notch of the sternum, at the level of the aortic arch, which makes a well-marked projection; vibratory thrilling still more distinct in the subclavian arteries, especially in the left, not at the diastole. Nothing of this kind in the other arteries, the pulsation of which, perfectly regular, are well separated, doubled, and as if vibrating. The diagnosis given was, *considerable hypertrophy of the heart; ovoid dilatation of the substernal aorta; with cretaceous degeneration of its inner membrane, the surface of which is irregular and roughened.* This patient died on the 26th July 1847, without presenting any other new symptom excepting the presence of albumen in the urine, in consequence of the application of a large blister, which had been rendered necessary by the inflammatory symptoms of the lung and pleura.

Inspection presented the following facts. The heart very much enlarged, weighing 650 grammes, = 20 ounces Troy and about four-fifths, presented at its surface several white opaque patches. All its chambers were enlarged and hypertrophied; all its valves well formed and adequate: the valves of the aortic orifice, though thickened generally, appeared in no way altered; the corresponding orifice was from eleven to twelve centimetres in circumference. As soon as the chest was opened, the aneurismal tumour of the aorta appeared. After slitting open the dilated aorta, so as to see its opening in the left ventricle, instead of one opening there were two; in other words, in place of one single aorta, two united to each other, and with a *septum* or partition between them. These two *aortae*, or these two divisions of one and the same aorta, were of the same length, but not of the same size. The largest arose from the right side of the left ventricle; the smallest from the left side of that chamber. From that point they proceeded together to the last lumbar *vertebra*, and terminated the large canal in the right common iliac artery, the small one in the left common iliac. In the sternal region, the large aorta covered, and in some degree concealed, the small one which was behind it. In the descending course of these two vessels, the large vessel was on the right and a little behind; the small vessel on the left and a little anterior. The *septum* or partition which thus divided the aorta arose at the level of the free margin of the aortic semilunar valves. There it appeared in the form of a diaphragm or membrane, pierced on the right with an annular opening of from two and a half to three centimetres in diameter, which opening belonged to the large aorta, dilated at its origin. The left aorta presented at its origin a funnel-shaped cavity, which was contracted to four centimetres, = one inch and a half, above its right opening in the ventricular orifice. Between the double opening which was observed at the origin of the inter-aortic *septum* and the single orifice of the left ventricle, was a sort of sinus, which was traversed by the blood crossing from the left ventricle, before it entered the two *aortae*, by the double opening already specified. The inter-aortic partition, in its ascending portion, was penetrated by several small, round, lenticular openings, by which the two *aortae* communicated with each other. These openings were less numerous at the upper than at the lower portion, especially quite below, immediately above the common iliac trunks, where the inter-aortic partition presented an opening much larger than those previously mentioned, of oval shape, and giving a close resemblance to the *foramen ovale* unobliterated. The diameter of this last opening was one centimetre, = more than one-third of an inch. Its circumference, like that of the *foramen ovale*, was provided with a sort of valve with thin sharp edges.

The brachio-cephalic trunk, (*innominata*), the left common carotid artery, the intercostal and lumbar arteries, the cœliac artery, and the superior and inferior mesenteric arteries, were all sent off from the small aorta. The left subclavian artery arose at the same time from the large and the small aorta, so that, like the aorta itself, it was double or bifid. A partition, analogous to that of the aorta, was common to the two divisions, of which the subclavian at its commencement consisted. One of the renal arteries arose from the large aorta; the other was sent off by the small trunk. The two coronary arteries arose in the same manner.

At the points corresponding to the brachio-cephalic trunk, of the left carotid, of the cœliac artery, and of the mesenteric arteries, the large aorta furnished no arterial trunk; but it presented depressions or recesses, which must be regarded as vestiges or rudimentary forms of those arteries which were abortive, and had probably been obliterated in the early periods of their evolution. These depressions were situated beside the arteries specified, where they arose from the small aorta.

The internal circumference of the large aorta was from six to seven centimetres, = two and one-third inches to two and a-half, excepting at the point occupied by the aneurism. At its origin, as has been seen, the small aorta was dilated in the form of a funnel; its internal circumference was nine centimetres, = three inches and a-half; it was only five centimetres, = one inch and nine-tenths, at the origin of the brachio-cephalic trunk (*innominata*); nine centimetres, in an enlargement or dilatation at the arch; from four centimetres to four centimetres and a-half, = one and a-half inch to one and three-fourths, in its descending thoracic portion; and from three to four centimetres in the abdominal portion.

The internal circumference of the brachio-cephalic trunk (*innominata*) was three centimetres, = one inch; that of the left common carotid, two centimetres and a-half; that of the portion of the subclavian artery, furnished by the large aorta, five centimetres, = one inch and nine-tenths; that of the portion of the same artery coming off from the small aorta, four centimetres, = one inch and a-half. The internal circumference of the common iliac artery, issuing from the large aorta, was four centimetres and one fourth, = one inch and three-fifths; that of the common iliac, proceeding from the small aorta, was three centimetres and three-fourths, = about one inch.

As already stated, the large aorta, immediately after its origin, was the seat of a large dilatation, and formed an ovoid tumour of the bulk of a turkey's egg, which occupied the right side of the chest. The cavity of the tumour contained recent clots in no degree adherent. The dilated walls were formed of three membranes, rather thickened than attenuated. The arc of a circle described by the right margin of the tumour, from its origin to its termination, was from fifteen to sixteen centimetres. The internal circumference of the most dilated portion of the aorta was from thirteen to fourteen centimetres, = five inches to five and a-half. This large aorta underwent sudden contraction, immediately on its being bent to form the arch of the aorta; there it was again dilated, forming a second tumour, of the size of a small egg, equally formed of the three arterial tunics. Proceeding from this point to its termination, the large aorta preserved perceptibly everywhere the same calibre. Through its whole extent it was occupied by calcareous and cretaceous degeneration, which was, as it were, confluent, particularly where it contributed to form the left subclavian artery; and the calcareous deposit extended for the space of one centimetre into the course of the little vessel.

The small aorta presented no degeneration, nor did the arteries to which either separately or with the large aorta, it gave birth. In this small aorta were found, however, some yellowish spots, a sort of prominent patch of a flesh-like aspect, and some fibrous and fibro-cartilaginous puckerings; but no calcareous plate or patch properly so called. At the point of its curvature, this small aorta was the seat of a saccular dilatation, united to the dilatation of the arch of the large aorta.

The lungs were strongly adherent and congested. The right lung, thrust aside by the dilated aorta, presented, near the root of the *bronchi*, a very remarkable depression.

The kidneys were of a deep red colour; the internal membrane of the *calyces* was greatly injected.

The case now detailed furnishes an instance of one of the most singular and rare errors in the development of the aorta. In a teratological point of view, it may be regarded as the persistence of a temporary disposition in the conformation of the aorta, which is composed, at a certain period of intra-uterine life, of two canals, which are subsequently conjoined into one, namely, the two common iliacs, according to Baer, Muller, and Rolando. This, however, is not the opinion of Bischoff, who, in his researches on embryology, after showing how the bulb or swelling of the aorta is formed, adds: The metamorphosis of this artery, which is produced from the aortic bulb, consists in this, that they are observed first to be twisted in a spiral direction; after which there is developed, in its middle, a partition, from which result two canals twisted upon each other. One of these canals communicates with the right ventricular portion, the other with the left.

M. Serres has ascertained something analogous in birds towards the fortieth or the fiftieth hour of incubation.

Whatever view is taken, this observation contains circumstances on which embryology throws only a very doubtful light; for instance, all the peculiarities relating to the origin of the arteries furnished by the two *aortæ*, or by the two divisions of one and the same aorta; the origin of the double aorta itself; the mutual communications of the two arteries with each other by virtue of the apertures in the septum. In a pathological point of view, this case also is interesting, on the one hand, from the nature of the alterations which affected one of the two *aortæ;* and on the other, from the aorta of one side not partaking in the lesions which had attacked its companion.

Malignant Follicular Disease of the Œsophagus terminating in Ulceration, forming a communication with the Trachea and left Bronchus. By HORACE GREEN, M.D., &c. (A Treatise on the Diseases of the Air Passages, &c. New York, 1846. Chap. V. p. 134.) The following case is another instance of the kind of communication between the œsophagus and air passages, of which cases have been given in the Tenth Article of this number, and may be given here as a further illustration of the usual causes and progress of that species of communication.

C. C., aged 56, an intelligent lady of the Society of Friends, came to New York for medical advice in January 1844. For several years she had suffered under difficulty of swallowing, which at this time had increased to such a degree, as to render it impossible for her to swallow food, except such as could be taken in a liquid form.

When she was examined, on the 14th January 1844, the patient was then pale, and enfeebled, from having lived more than twelve months upon fluids. The general health, however, appeared not much impaired. The appetite was good. The voice was husky, without cough; the sounds from the chest were normal. She admitted the presence of no pain, except slight uneasiness in the right breast; but she complained of dryness of the throat, and of soreness felt when any attempt at deglutition was made.

The mucous lining of the fauces appeared injected; and the follicles of the pharynx were in a state of enlargement; but no ulceration in any of these glands was apparent; the epiglottis was healthy; and the patient complained of no pain or irritation in the laryngeal region. It was inferred, from the history of the case and the appearance of the throat, that the disease must have had its origin in the pharynx, had extended down the œsophagus, and had involved in its morbid action the follicles of that tube.

To the pharynx and the upper part of the œsophageal tube was applied a solution of the crystals of nitrate of silver, of the strength of one scruple of the salt to one ounce of water; and the patient was placed on the free use of Lugol's solution of iodine.

Topical medication was applied only once, as the lady left the city immediately after the first application, and did not return until at the end of two weeks. At this time she complained less of soreness and difficulty of deglutition, but was still unable to swallow food except in a liquid form. The ability to take nourishment in this manner continued until about the 16th of February, when the power of deglutition entirely failed. As she resided in Westchester County, about fifteen miles from New York, no efficient assistance was obtained, and the patient passed nearly three days without receiving any sustenance whatever. On the 19th of February, when she was visited by Dr Green, he found her in a state of great exhaustion from fasting; nausea was constant; and occasional efforts at vomiting were made; but nothing was ejected from the stomach. Liquids taken into the mouth, passed down the œsophagus, apparently to the cardiac orifice, but were then returned.

Dr Green introduced through the œsophagus Hutchison's Second Size Stomach Tube, intending thus to convey some soup into the stomach. The tube passed the cardiac orifice so readily, that he withdrew it, in order to introduce the tube of largest size. Before doing this, however, he directed the patient to swallow one spoonful of the fluid. This she did without difficulty, and the whole amount was taken into the stomach by spoonfuls.

Dr Green did not again see the patient until the 27th of July 1844, nearly six months afterwards. But from the 19th February, the period at which the stomach tube was introduced, until the 2d of August, when she breathed her last, she continued to swallow food in a liquid form in sufficient quantities to sustain life. She wasted, nevertheless, gradually away; and when Dr Green saw her on the 29th July, she was greatly emaciated and very feeble. The voice was husky and faint; and she presented symptoms of great bronchial irritation. On the 2d of August she was attacked suddenly with violent cough, accompanied with great dyspnœa and a burning pain under the upper portion of the sternum. Under these symptoms she sunk rapidly, and died in a few hours.

Inspection of the body twenty-four hours after death by the author and Dr R. Nelson, disclosed the following appearances:—

The stomach and the cardiac orifice were healthy. The right lung was also sound, the left lung presented at its apex tubercles, some of which had advanced to suppuration. The œsophagus was adherent to the dorsal and cervical vertebræ by cellular tissue, which was in a morbid state.

The whole extent nearly of the œsophagus was diseased in a very serious degree. The mucous glands at its upper portion were in a skirrhous state; while all the follicles below were destroyed by ulceration. Commencing near the level of the cricoid cartilage was a deep ragged ulcer, occupying the anterior half of the œsophagus, and extending downwards several inches below the bifurcation of the *trachea*. Near the centre of this ulcer, it had not only destroyed the cellular and muscular coats of the œsophagus, but had involved a portion of the posterior wall of the *trachea*, and at one point had penetrated the left *bronchus*, thus forming a direct opening from the œsophagus into the lungs. Through this opening, which was of sufficient size to admit the tip of the finger, alimentary and other matters from the œsophagus had found their way into the left *bronchus* and its ramifications, producing the symptoms of suffocation, and proving the immediate cause of death.

Numerous bony spiculæ were found penetrating the ulcerated portions of the œsophagus. These were ascertained to be portions of the ossified rings of the *trachea* and *bronchi*, which had become carious and were broken up.

All the rest of the left lung, except the apex, as already specified, was healthy. The tubercles, which had undergone suppuration, were near the ulcerated opening.

Traces of considerable inflammation were found within the *trachea;* the mucous membrane was thickened; its follicles were hypertrophied; and in some places, these, together with the lining membrane, were destroyed by ulceration. Several portions of the cartilaginous rings, and of those of the bronchi, as already stated, had become carious and were broken up. The lips of the glottis, the epiglottis, and the arytenoid cartilages were highly œdematous. The thyroid and cricoid cartilages were in a state still worse. The left lateral part of the thyroid cartilage was denuded by ulceration, and in a state of nekrosis. One-half of the cricoid cartilage on the same side was in like manner denuded, and nearly destroyed by nekrosis.

A representation of some of these parts is given in plate sixth of the work of Dr Green.

The case now detailed furnishes an important addition to those already given in the Tenth Article, of examples of communication between the *œsophagus* and the *trachea* and *bronchi.* In that communication, excluding the four doubtful cases which are placed in the fifth category, there are given twenty-one cases, in which this unnatural communication was either accomplished and had caused the death of the patient, or was on the eve of being accomplished. The case now given forms the twenty-second, and may be enumerated in the list immediately after that recorded by Dr Garthshore, and inspected by John Hunter; to which, in various respects, it bears a resemblance. This case tends not only to illustrate the general course of this lesion as a pathological process, but it confirms the conclusion already in some degree enunciated, that the ulceration which produces these communications is of a destructive or incurable character, and is the effect either of skirrhous degeneration or some allied morbid structure. Dr Green represents it to be skirrhus of the follicles; and, probably, these glands were the original seat of this morbid change.

Another inference this case tends to place on a more solid foundation, than that on which it previously rested. M. Vigla is inclined to think that life may be prolonged for a considerable time after this communication between the œsophagus and the respiratory organs has been established. Of the justness of this inference there is no evidence. On the contrary, there is every reason to believe, that when once this communication has been established, death is either very near, or not very distant, and may take place suddenly. In the present case, everything concurs to show, that the communication had been completed either between the 1st and 2d of August, or on the morning of the latter day. This is shown by the sudden accession of violent cough, great breathlessness, and burning pain, with which the patient was attacked on the morning of the 2d of August. The sudden advent of these symptoms, and their speedy termination in death, were perfectly explained by the communication found between the œsophagus and left *bronchus.*

If the facts of this case be compared with those of the 10th Article, for instance, the 2d, 5th, 12th, 16th, and 25th, it will be seen that it is in the highest degree improbable, that life can be prolonged for any considerable time, after this unnatural communication between the interior of the œsophagus and the air passages has been established.

Case of Fatal Pleurisy, the Effect apparently of the Presence in the Right Pleura, of a Piece of Ivory, consisting of four Artificial Teeth, which had been swallowed thirteen years before. By W. G. Carpenter. *(Guy's Hospital Reports, Vol. vii. p. 353. London, October, 1842.)*—The following case, though not exactly referring itself to any of the heads adopted by M. Vigla, and therefore not inserted in the Tenth Article, makes, however, so near an approach to the conditions of the second and fifth categories, that it is not unseasonable to introduce it in this place. As it is probably not known to M. Vigla, it may be useful in illustrating the subject of his dissertation.

Mr H., aged 35, had resided for upwards of eight years as assistant to Mr W., an extensive chemist in the Edgeware Road. Mr H. had been from childhood afflicted with asthmatic bronchitis; and several members of his family had fallen victims to pleuritic, pulmonic or tracheal affections. When first known to Mr Carpenter, in the winter of 1841, he was never free from fever. The pulse was always above 100, and the skin hot. He passed the winter without any remission of symptoms, which indeed seemed to be aggravated in the spring. On Friday, the 13th of April, Mr Carpenter was requested to see him when suffering under pain in the side and chest, which had that evening become so acute as to render speaking, coughing, and breathing almost impossible. The pain was seated in the right side of the chest, and shot up to the clavicle, increased in deep inspiration. Breathing was short and hurried, cough troublesome. The pulse at 140, wiry. On the right, the anterior and posterior part of the chest emitted a dull sound on percussion, and the respiratory murmur was inaudible. No dulness on left side; and the respiratory murmur was louder, and accompanied with mucous rattle.

Blood was drawn from the arm, and calomel, antimony, and colocynth was given. The blood was buffed and cupped. Little relief followed. Blood-letting was repeated, and two local bleedings, with all the usual remedies for disease of the lungs and pleura; counter-irritation, poultice, with diet afterwards more nutritious. Death took place on the 19th of April, the sixth day after the appearance of acute symptoms.

Air and five pints of sero-purulent fluid were found within the right pleura. The right lung was collapsed, and pressed against the vertebræ. The pleura was thickly covered with several layers of lymph. On the outer surface of the lung was an old fistulous opening, large enough to admit the tip of the little finger. The lung contained a number of tubercles, some of which had suppurated. Some of the bronchial rings were ossified.

The left lung was emphysematous, and contained miliary tubercles. The pleura on this side was healthy; but the small bronchial tubes were filled with mucus.

After the examination was completed, and the inspector was removing the remaining fluid and coagula of blood that had escaped from the pulmonary veins, to replace the lung, he came upon an irregular body, which turned out to be a piece of ivory, worked into the form of four artificial front-teeth, covered with a brownish crust, with a pointed piece of silver rivetted into the upper part of the teeth, which had assisted in fixing them to the upper jaw. The base of the silver rivet was surrounded with wadding. At each extremity were two holes, which no doubt once contained the wire that fixed this mass of false teeth to the adjoining sound ones.

The father of Mr H., being at the time in the house, and being referred to, immediately stated that his son had swallowed the artificial teeth in a fit of coughing about thirteen years previously, during his apprenticeship at Scarborough. Mr C. again examined the œsophagus, and was satisfied that it presented neither a recent wound nor a cicatrix. The only opening through which the ivory could have escaped into the pleura of the right thoracic cavity, where it was found, must have been the fistulous opening in the corresponding lung.

From the statement of Dr Kelk of Scarborough, who appears to have prescribed for Mr H. and that of Mr Eccles of Brompton, near Scarborough, at that time a fellow-apprentice of the patient, it does not appear that his sufferings were materially increased after the accident, or that he was unable to attend to business. The morning after the accident happened, he mentioned the circumstance to his master, Mr Champley, who, supposing that the teeth had passed into the stomach, advised him to take an aperient. It was believed that the piece of ivory had passed away by the bowels unnoticed, and afterwards the circumstance was gradually forgotten.

This case, though making an approach to some of those collected by M. Vigla, differs, on the other hand, from them very materially. It seems rather to class itself with that of foreign bodies which have dropped into the *trachea*, and then given rise to *bronchitis*, pneumonia, and pleurisy. No clear and unequivocal proof is afforded that the false teeth had dropped into the œsophagus, and there stopped and caused ulceration. Had they done so, symptoms of difficult deglutition must assuredly have followed; then most likely indications of a communication between the œsophagus and the thoracic organs would have appeared; and in all probability a cicatrix or the trace of an ulcer would have been found in the œsophagus after death. None of these circumstances were recognized to have taken place. On the other, the long-protracted and obstinate character of the pulmonary symptoms, by which the patient was afflicted, are exactly the effects that we find take place, in all other cases, in which foreign bodies have been drawn into the trachea. Though for all these reasons it was impossible to place this case among any of those given by M. Vigla, yet its being recorded here, as a sort of appendix to that paper, may be not without advantage.

It seems to be the opinion of Mr Carpenter, that the piece of ivory in this case had been introduced by the trachea. He thinks it certain, that it gradually made its way by suppuration through the lung. Yet the fistulous opening on the surface of the lung led to no passage or communication with the *bronchi*, for the probe could not be passed through any distinct channel; yet, it may be asked, whence had the air proceeded which was found within the pleura? The case was one of pneumothorax as well as pleurisy; and though air may in some rare cases be formed without communication with the tubes, it is much more common for it to be formed in that manner.

It is scarcely necessary to observe that, after the accident, any symptoms of cough or difficult breathing which the patient might suffer, would be more readily overlooked, as they would be thought to be a mere aggravation of the pulmonary disorder under which this gentleman had laboured from infancy.

II. MEDICAL PATHOLOGY.

Concretions of Magnesia in the Bowels after the Use of Fluid Magnesia or the Supercarbonic Solution. (*Lectures on Clinical Medicine, by* Dr Graves, Vol. ii. p. 223. Lond. Dub. 1848.)—Magnesia, and especially calcined magnesia, has at all times been strongly recommended as a remedy in dyspeptic disorders, and especially in the dyspeptic complaints of gouty persons and those who are liable to gravel. A general belief, nevertheless, was always entertained, that it was not altogether a safe remedy; that it was liable to be accumulated within the alimentary canal; and that thus it might cause obstruction not less serious than the disorders for the relief of which it was employed. It was in order to obviate this evil, therefore, usually given combined with some laxative medicine, that, as was imagined, after it had saturated the acid in the stomach, it might not remain as an insoluble compound in the intestines. Every one knows that the most usual combination of this kind is magnesia and rhubarb, with a little ginger as a carminative; and in this form, accordingly, it has been long and very extensively used in the practice of medicine and in domestic practice. The idea, above mentioned, of the hazard resulting from the use of magnesia alone,—though current among many medical practitioners for a long time, probably ever since chemical reasoning was much used, and Dr Black's essay on magnesia was published,—received considerable corroboration from the opinions advanced by Sir Everard Home and Mr Brande, in which these gentlemen stated, in confident terms, the proposition, that magnesia given alone was always a hazardous remedy, and that it ought never to be given unless combined with or followed by an active, or at least efficient aperient. As this indication was well fulfilled by combination above mentioned, the objection, it was conceived, was obviated by the use of the compound powder, and would assuredly be removed by the subsequent or occasional use of laxative medicine.

This mixture, however, is to many persons not very agreeable; and its frequent use must have always been unpleasant. To such persons the fluid magnesia, prepared as recommended by Sir James Murray, was believed to be a great boon; and all who suffered from heartburn and other dyspeptic symptoms, had recourse to the fluid magnesia with great confidence and little apprehension. It now appears that, if we can trust the facts of the following case, this remedy is quite as capable of assuming the solid shape, and forming concretions in the intestines, as either the carbonate of magnesia or pure magnesia. Dr Graves thinks that the use of fluid magnesia has had the desired effect of preventing the formation of magnesia concretions in the intestines, which are, he observes, of extreme rarity in the present day. He warns his readers, nevertheless, that he has seen two instances, one of which having occurred in the person of a medical friend, was likely to be correctly stated.

For a considerable period, that is, two or three years, this gentleman was in the habit of taking, whenever he felt any dyspeptic symptoms, a wineglassful of the magnesian water, as prepared by Sir James Murray and Messrs Thwaites of Sackville Street; and during that time, whenever he caught cold and became ill, he generally felt pain in the right iliac fossa, which on taking medicine disappeared.

A repetition of these attacks required the use of leeches. The last attack, he thinks, occurred in March 1843.

He was sitting in his chamber reading, not feeling very well, when suddenly he felt very acute pain in the right iliac region, with a sensation of faintness, upon which he went to bed, had warm fomentations applied, and sent for Dr Graves. The condition of the patient being alarming, his wife sent in all directions for medical assistance; and in about half an hour there were beside him five medical men, who applied turpentine fomentations; and as the skin had been well softened by the warm water used before they came, he suffered considerably from smarting soreness. Soon after, leeches were applied, and a full dose of oil of turpentine and castor oil was ordered. The latter, after remaining ten hours in the stomach, was entirely rejected by vomiting.

The details of treatment he did not remember when he gave this report.

But he became convalescent; and nothing appears to have been suspected of the true nature of the complaint, either by the patient himself or his professional friends. Dr Graves, in the meantime, advised him to take every morning a tea-spoonful of castor oil in warm milk, which he continued to do for some time.

He had made arrangements for going to England, when he felt what he believed to be internal piles, and sent accordingly for the late Dr Houston, who, after examination and consultation with Dr Beatty of Merion Square, said that the patient had fissure of the rectum, and recommended for its removal the application of nitrate of silver. This was accordingly done, but caused torture so great, that the patient was obliged to take anodynes at three different times in order to allay the irritation produced after the use of the caustic. This was followed by great confinement of the bowels, and to counteract this Dr Houston ordered a strong purgative draught.

On quitting the night chair he found that the discharge consisted of a multitude of round whitish bodies floating in a cream-coloured fluid, emitting a peculiar odour, and one of them the size of a large horse-chestnut with the spines rubbed off. This was afterwards analyzed by Dr Aldridge, who subsequently informed him that it was composed of carbonate of magnesia mixed with some animal and vegetable matters.

The discharge contained also a perfect grape, which the patient thinks must have been at least six months in the cæcum or behind the mass, as that period elapsed since he had last eaten grapes.

From the facts now stated the patient himself draws the following inferences:—

1*st*, That from drinking magnesia water there took place a deposit, which settled in the cæcum, and there remained a considerable time.

2*d*, That during a very severe illness, in consequence, no doubt, of such deposit, he was ordered by Dr Graves to take every morning small doses of castor-oil, which he is satisfied acted mechanically by insinuating itself between the bodies forming the mass, and which was finally carried away by a strong purgative draught.

Since that time, the individual has never felt the same or any uneasiness in the right iliac region. He has never tasted magnesia water since.

A Painful Affection of the Feet, like that named Acrodynia by several French observers. By Dr Graves. (Clinical Medicine, Lecture XVIII. Vol. ii. p. 510. 1848).—Professor Müller and Dr Houston have endeavoured to show, that there are provisions in the veins and arteries, calculated to favour the rapid afflux of blood to the erectile tissues. But their explanations are quite insufficient to account for the phenomenon, which remains a striking instance of the power possessed by the nerves and arteries, of a part in producing a great and instantaneous change in its circulation, independent of any impulse from the heart; and the fact can be only explained by supposing, that the vital influence of each part has the principal share in modifying its own capillary circulation. The cases now about to be related briefly, all bear upon this question.

1. The first is that of a young lady who had the catamenia suppressed at the age of sixteen, and who had been for some time in a bad state of health. After an accidental diarrhœa, which weakened her greatly, she became subject to a very curious affection of the feet and legs. The attack generally commenced at night, involving the foot, ankle, and leg, half way to the knee. It is generally confined to one foot and leg at a time, and when it subsides in one extremity begins in the other. The affection commenced with heat and tingling of the sole of the foot, then of the instep, ankle, and leg, as high as the middle of the calf. These symptoms go on increasing for some time, the sensation of heat becomes extreme, and the pain agonizing. In proportion to the increase of these symptoms, the vascular congestion and fulness of the limb are augmented; the smallest veins are rendered distinct, and the larger ones become prominent. This state lasts for eight or nine hours, the sensation of heat and pain being all the time nearly insupportable.

The resulting congestion of the cutaneous capillaries occasions a change in the skin, which, as the fit proceeds, grows at first red, and then gradually assumes a more suffused appearance, and a deeper hue, until it becomes swollen, smooth, and shining, and resembles very much in colour a black cherry when nearly ripe. When the hot fit ceases, the slight swelling and this discoloration subside, and the affected parts remain during the next stage pale, deadly cold, and comparatively free from pain. While one leg is in the hot stage, the opposite leg is cold and pale, but free from pain; but as soon as the pain and heat have disappeared in the limb first affected, the same series of phenomena commences in the other leg, and lasts for the same length of time; after which both limbs are in their natural state, and for two or three hours she is comparatively free from suffering, although some uneasiness still remains, which she compares to a numbness, or some such morbid sensation not easily defined.

This disease commenced in 1837, and its paroxysms have returned every day since that time. At first, the pain was intolerable, and the daily amount of ease she enjoyed did not exceed three hours. This occurred quite regularly, beginning about four, and lasting until seven o'clock in the morning, during which three hours she had some sleep. In October 1840, the intermission occurred at eleven A.M., and continued until seven in the evening. In 1837, she could not sleep at all when either foot was in the hot fit, so great was the pain. In 1840, she enjoyed tolerable rest at night, although one or other of the extremities be in the hot stage during the whole time she is in bed. She is much improved in appearance; and though of slender form and tall, she has become sufficiently fat; and being a person of most placid temper and great beauty, no one who sees her in the drawing-room, apparently in all the bloom of health, would suspect her to be such a martyr. Even now she is obliged to sit or recline on the sofa during the entire day, for if she walks much about the room, the hot fit in her limbs is immediately brought on. The suppression of the catamenia made us at first consider this strange affection as a variety of hysteria, but in about six months the female function resumed a perfect regularity, without bringing the slightest alleviation of the symptoms.

Neither could the continuance of the disease be attributed to any particular constitutional defect; for though her form was slender, her aspect was healthy, and her general state of health was better than could have been expected, considering her nearly unceasing pain, and almost total want of sleep.

On the 10th January 1837, little change had taken place. The appetite was gone; the looks indicating great delicacy; the feet particularly hot and inflamed, and continued severely affected during the intense cold of the weather. Frost and snow having prevailed, the patient was not out for weeks. At this time, the only remedy that afforded relief was the application of cold water. Cloths dipped in the coldest water that could be procured were applied to the feet and legs constantly during the night. The extreme severity of the pain was occasionally alleviated by gently brushing with the hand the affected parts, and slightly patting them.

On the 23d March 1838, the limbs were reported to be unceasingly in a state of swelling particularly distressing, and, whether cold or hot, equally painful. Indeed, both the cold and hot stages of the complaint were now attended with acute pains and extreme discoloration, worse than what was felt in Dublin. The skin at this time was glistening as in rose. The soreness to the touch was greater than usual. The nights were also worse; while the marks of exhaustion and lassitude during the day were visible. The menstrual effort, which had recently taken place, had been followed by no relief to the feet. The appetite was still declining.

On the 26th April 1838, the state of the limbs continued unimproved. The flow of blood had returned to its former course, namely, the feet; the rush was sudden, and extended immediately to the toes, instead of tarrying, as it previously seemed to do, at the instep and heel. The heat was as intense as when in Dublin; but the cold stage was less painful. The cold and numbness were at this time felt all the way up the legs. Previously it was only from the ankles over the foot. When the patient reclined on a bed or sofa during the cold stage, the sensation in rising from either was particularly distressing.

The veins, each morning on leaving bed, were greatly distended. A livid colour overspread the feet as formerly in Dublin, and also when cold. The only application employed was milk and water, and frequent gentle champooing or patting. This, however, could not be used so freely as formerly, in consequence of the extreme tenderness of the parts.

Swelling of the feet sometimes continued through the entire day, and generally the hot fit was more protracted than formerly, never less, often more, than twelve or fourteen hours.

The patient now experienced a tendency to palpitation which she had not before felt, without its being traceable to any particular cause. When the palpitation of the heart comes on, a similar feeling is experienced in the limbs, especially from the calves of the legs downwards, as if there also palpitation were going on. This palpitation is not induced by ascending stairs.

The bowels at this time required assistance as formerly; but all that is requisite was accomplished by magnesia. Flushings of the face were frequent; and sleepiness ensued after the mid-day glass of wine, though diluted with water. Generally speaking, the looks of the patient were improved, though she was not more corpulent than when in Dublin. The patient herself had at this time scarcely any hope of ever being relieved from the peculiar painful disorder of the feet.

On May 7th 1838, the nights were reported to be sleepless and painful; the days little less so, as heat and swelling seldom abated. Discoloration and swelling were general all over the feet, ankles, and instep. At the back of the legs, close to the commencement of the calves, a lump appeared to be forming; and from that point to the knee, the posterior parts of the legs were particularly hard to the touch. The skin of the feet and toes was still glistening.

The limbs, both when hot and when cold, were the seat of a sense of great weight. The coldness and the burning heat were equally in extreme. With the slightest approach of warmth commences the pain.

The appetite and strength were not improved. The urinary secretion was scanty, reddish-coloured, and muddy; the sediment was white and reddish in colour. The bowels require assistance every fourth or fifth day. The use of magnesia, however, is followed by extreme sickness, and faintishness following each movement of the bowels after its use.

On the 25th May 1838, the different symptoms were much in the same state.

"On first arising out of bed in the morning, she feels as though the veins at the back of the legs, towards the calves, were cutting asunder by some sharp instrument. Walking evidently increases the determination downwards, and excites the pain and swelling more than any other thing; yet *walking* would be her *favourite* exercise, if she could use it to any comfortable extent. When taking a drive in the carriage, she gets great pain in her left side. Headaches are frequent, and her complexion very variable during the last fortnight. Bowels have not acted at all, *unless assisted,* since I last wrote to you; and after magnesia on Wednesday morning, extreme pain and sickness ensued, and a number of constipated lumps came away. Appetite is far from good; thirst increases greatly; wine in the middle of the day causes immediate flushing, and a disposition to perspire over the hands, face, and neck. She often feels as though a stream of water, icy cold, was rushing down through her limbs, and when rising from her chair during the cold stage, feels as though she stood in snow."

It is remarkable that the disease of the feet was not accompanied by the least derangement of the general circulation, or of the state of the rest of the skin.

This young lady was frequently seen by Sir Philip Crampton, Mr Colles, and Mr Cusack, and her case excited in their minds the greatest interest, for they had never witnessed anything similar. At first, chronic inflammation of the arteries in the limbs was suspected; but this suspicion was set aside by the subsequent duration and course of the malady.

No plan of treatment, whether general or topical, which afforded the slightest prospect of relief, was neglected. Every variety of lotion, cold and hot, stimulating or narcotic, of ointments, bandages, poultices, affusions, were successively tried, and the parts were often leeched in the hot stage, but without any relief. Internally, quina, arsenic, iodine, hydriodate of potash, chalybeates, purgatives, diuretics, and mercurialization, have all successively failed; nor has she ever received the slightest benefit from any anodyne medicine whatsoever. From the resemblance which the derangement in the circulation of her limbs bears to that produced by ergot of rye, Dr Graves was led to try that medicine, but it produced no notable effect on the disease. It is curious that this long-continued derangement in the circulation of her lower extremities, and the extraordinary pain the patient experienced daily for six years, have not produced any paralysis, any diminution of muscular power, thickening of the skin, induration of the subcutaneous areolar tissue, or stiffness of the joints. Considering how hot, red, and swollen a considerable portion of each limb is during many hours every day, it is quite surprising that no evident alteration of structure was the result. This fact is extremely interesting in a physiological and pathological point of view, proving, as it undoubtedly does, that changes in texture are influenced by causes quite independent of the state of the local circulation.

In general, we observe, that increased sensibility of the nerves of any part, when long continued and severe, is followed by a proportional paralysis of sensation; but in the case before us, the cutaneous nerves of the leg have been exquisitely painful for years, and yet not the least approach to paralysis, either of sense or motion, is perceptible.

In 1843, when Dr Graves published the first edition of his Lectures on Clinical Medicine, he inserted in a note the following account of the last report of this young lady's state:—The disease still continues without any intermission, being as before, much worse in winter; but, on the whole, the pain is not so severe as formerly, and the daily paroxysms are of shorter duration. In proportion as the pain and intensity of the heat have somewhat diminished, her general appearance and health have improved.

Since then, he has received numerous communications from several parts of the world, England, America, &c., suggesting the most varied plans of treatment, and the most different opinions, as to the cause of this affection. But although nearly every remedy in the pharmacopœia was tried, none seemed to have had the least effect; and she gradually got well, it might be said, in spite of medicine, and has now been quite free from the disease for more than twelve months.

Although Dr Graves has not witnessed anything precisely similar to this case, yet he has seen a few local affections which presented some analogous symptoms. One of these, which Dr G. saw with Mr Moore of Anne Street, and which was seen occasionally by Sir Philip Crampton, is the following.

2. Mrs ——, aged 82, of a robust and healthy constitution, florid complexion, in the month of February 1839, had a slight paralytic affection of the left arm and leg, preceded and accompanied by headach, vertigo, flashes of light before the eyes, &c. About a month ago, she experienced a sensation of cold in the right foot, which, on rubbing the part, gave place to a feeling of heat and itching. On examination, she found that the anterior half of the foot was swollen and red. In about three weeks from the first seizure, the sensation of cold continuing, it became extremely painful, and she then first applied for medical advice.

August 1st, 1839.—Complains of severe pain in anterior part of right foot, which is swollen and red; there is considerable œdema of the ankle and lower part of the leg; the extremities of the toes are dark-red, with some lividity. Her general health is good, with the exception of occasional headach with vertigo. Bowels free; appetite good; pulse regular.

She was ordered a stimulating liniment, and internally small doses of hydriodate of potash.

5th.—She experienced much relief from the use of the liniment. The œdema about the ankle is much less, but the swelling of the anterior part of the foot continues nearly as before.

13th.—The great toe has to-day a peculiar shining and *bloody* appearance; the fourth is livid at the extremity; the second and third are red, but not livid. Four leeches were applied to the great toe, followed by a poultice of bread, milk, and oil, to the foot. It was impossible to get the leeches to take on the other toes, in consequence of the recent use of belladonna liniment.

15th.—The toe to which the leeches were applied has been completely relieved, but the livid appearance of the fourth still continues; second and third appear much swollen, and are very painful. Ordered to apply two leeches to each, and one to fourth.

17th.—Considerable pain last night. We thought now that the pain, redness, and swelling exhibited exacerbations, recurring every second day, and we accordingly gave her quina in small doses, and again leeched the toes. As the quina disagreed with her stomach, it was administered every night in a starch injection, with a few drops of laudanum, and continued for a week; while the toes most affected were repeatedly leeched, and various soothing and anodyne applications tried. The pain was of a most excruciating character, and its exacerbations, though not regularly periodical, showed a decided tendency to return every second morning at a given hour. Sometimes one toe, and sometimes two, or more, were simultaneously attacked; and in proportion to the intensity of the pain, the affected parts became swollen, red, and then of a shining purple hue. Such was the course of the disease from the 1st of August to the 15th of September.

On this evening, Sir Philip Crampton saw her, and recommended that she should take three times daily, a draught consisting of twenty minims of wine of meadow saffron root in one ounce of camphor mixture; and that a poultice should be applied, containing half an ounce of extract of hemlock and ten grains of watery extract of opium, with one pint of decoction of white poppy.

Next day the pain was completely relieved, and though it returned the following day, it was less violent. The draught of meadow saffron was repeated.

30th.—The foot has been, since last report, gradually assuming its natural appearance; there is now very little swelling or lividity. The pain has not latterly been so intense, and is of a different character, being described as resembling the sensation experienced when the circulation is returning in a limb which had been "asleep." The accessions are now generally in the evening, to which they have gradually come, occurring at three, two, one, twelve o'clock, and so on. Applications which formerly gave great relief are now followed by intense pain, and cannot be borne, as anodyne liniment; the application of fresh hemlock bruised was also intolerable. Emollient applications, as chamomile stupes, bread and milk poultices, give most relief. General health is good; is at present using effervescing draughts with tincture of orange-peel.

October 7th.—The foot has not been painful since last report, and its appearance now is as nearly as possible natural.

Soon after this she got a slight paralytic stroke, followed by more severe attacks of an apoplectic nature, and expired in consequence of cerebral disease, on the 25th November.

It is obvious that the good effects of the colchicum may excite the suspicion, that the inflammation was of a gouty nature; still, however, the manner in which it so gradually began, the remarkable violence of the pain, and the change of colour in the skin which accompanied each paroxysm, were of so striking a character, and presented analogies with the case of the young lady before related, so obvious, that I have thought it right to place the history of the two cases side by side.

The absence of dyspepsia, and all constitutional or local symptoms of gout, up to the age of eighty-two; the freedom from gouty deposits, which the urine exhibited throughout the whole course of the old lady's malady; and various circumstances that cannot have escaped your notice,—render the hypothesis which ascribed her suffering to gout more than doubtful, and the doubt is still further increased by the very gradual manner in which the disease subsided under the use of colchicum, and its preserving its "tertian" character to the end.

The affection of the foot and toes was so painful, and the discoloration and purple hue of the skin so intense, that the medical attendants naturally apprehended its terminating in something like *senile gangrene.*

Case of large Gall-Stone which found its way through the right Hypochondre, with Ulceration of the Gall-Bladder and consecutive Biliary Fistula. By Dr Santo Nobili. (*Annali Universali di Medicina. Febraio* 1847). —Instances of gall-stones procuring to themselves an exit through the abdominal parietes, though probably less frequent than those which come away by the intestinal canal, are nevertheless now rather numerous. Several, either complete or in the process of escape, have been noticed in various periodical works; and a short abstract of the most important is given in the last edition of Dr Craigie's Elements of Pathological Anatomy.* The following is another instance added to the list.

A peasant, aged thirty-nine years, entered the Hospital of Caravacci for symptoms of dysentery which had lasted for six years, but which had been aggravated for one month previous to admission. The man was emaciated, and his appearance was cachectic. He felt frequent pains in the epigastric region, a sense of constriction towards the hypochondria; enteralgia with tenesmus; and he was unable to stoop forwards. In examining the abdominal region, Dr Nobili felt resistance in the region of the liver. Two months afterwards, to the phenomena now mentioned were added slight fever, which recurred every evening, and swelling in the right hypochondriac region still more considerable. Supposing that there must be a foreign body, Dr N. applied caustic potass upon the most prominent point. The incision of the eschar allowed to issue a large quantity of white inodorous matter; and in the opening there was felt, by the aid of the probe, a hard body, which was at first believed to be a false rib. The wound was dilated by means of sponge tent. On the first day, the attendant distinguished, by the naked eye, at the bottom of the wound, a hard body, which filled the cavity of the abscess, and which, by a second mistake, was taken for a rib affected with nekrosis. About one month and a half afterwards, there was extracted from the wound a large pyriform gall-stone, two inches and a half long, and eight lines broad, with the apex rounded below, and the upper extremity or base rugous at the surface. A bent probe entered its entire length into a canal which went along the convex part of the liver, from below upwards, and from before backwards. A bougie entered in the same manner the depth of seven inches. Every morning the dressings were impregnated with yellow inodorous bile, which also filled the opening. In the evening there was only serous fluid and in small quantity.

The alvine evacuations were regular, but ashen-coloured. The urine presented nothing particular. At the time at which this case was published, the patient left his bed, walked in the wards of the hospital, and was in all respects well, excepting for the presence of the fistula.

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* Book v. Chapter II. Section iv. p. 926. Edin. 1848.

III. MATERIA MEDICA AND THERAPEUTICS.

On the Use of Preparations of Nux Vomica in the Treatment of St Vitus's Dance. By M. TROUSSEAU, *Academie de Medecine.*—MM. Lejeune, Niemann, and Cazenave adduced some isolated facts showing the curative powers of *nux vomica* in thetreatment of chorea. Subsequently, M. Trousseau, and also MM. Fouilhoux and Rougier of Lyons, reduced the treatment to an exact system. Public trials were made at the same time at Lyons, and at Paris in the Hôpital Necker. M. Trousseau was led by two reasons to employ this treatment. The first is, that in chorea there is almost always imperfect palsy of one side of the person; the second is, because the preparations of *nux vomica* exciting tetaniform tonic extractions, there was reason to hope that it was possible to substitute the nervous modification determined by strychnine for that which attends chorea.

M. Trousseau treated by this remedy thirteen patients,—ten with complete success. In one case the condition of the patient was aggravated; in another, the symptoms were only slightly relieved; the thirteenth case terminated in death. The amendment began ordinarily to appear after eight or ten days of treatment. The cure was completed in fifteen days in certain cases, but most frequently at the end of one month. M. Trousseau confined himself to the detail of two cases. One was a young person, of twelve, addicted to masturbation, and in whom chorea had proceeded to such extremities, that it was requisite to leave the patient naked in an apartment, the flooring and walls of which were covered with matting. This patient was cured in the space of five weeks.

The author insists particularly on the preparation of the remedy and its mode of administration. He renounces the extract of *nux vomica*, which is often badly prepared, and which further easily undergoes changes, when it is converted into pill mass. He equally rejects strychnine, which, being soluble only in 6.6000 times its weight of cold water, may be considered as nearly insoluble, and accordingly liable to cause mistakes and danger. He adopted exclusively the sulphate of strychnine, which he dissolves in simple syrup, in the proportion of five centigrammes to one hundred grammes of syrup. He gives, at first, ten grammes of syrup, equivalent to five milligrammes of one tenth of one grain of salt of strychnine, given in four doses, to be taken at intervals of four hours. He daily augments the dose of the syrup by five grammes, until there are manifested pricking sensations in the head, and feelings of slight muscular rigidity; to which it is always necessary to proceed. The doses of syrup are augmented or diminished according to the effect produced. When the attack of chorea is nearly cured, the practitioner adheres to the same doses for several days; then they are diminished, and at length the remedy is stopped, when all the grimaces and contortions presented by the patients in this disease are gone. M. Trousseau regards the exhalation of the sulphate of strychnine as the principal and essential treatment. He nevertheless fulfils other indications. Bloodletting is practised if chorea is associated with plethora; chalybeates are administered if the disease is combined with chlorosis, as oftimes happens; and antispasmodics, if it be complicated with hysteria.

Counter-Irritation by means of the Heated Hammer. By Dr CORRIGAN and Dr DAY. Practical Treatise on the Domestic Management and Most Important Diseases of Advanced Life. London, 1849. 8vo. Pp. 325.—In an appendix to the work now mentioned, Dr Day directs the attention of the profession to the convenience, promptitude, and efficacy of a mode of producing counter-irritation, which he finds to be of great use in the treatment of various rheumatic and neuralgic affections. This consists in applying, for one instant or such a space, to the skin, a flat iron button gently heated by the flame of a spirit-lamp. The operation is completed in a few seconds; it is productive of little or no pain; it is very speedy in its effects; it is not said whether pathological or therapeutic; and it is quite free from harm.

The merit of introducing this method of medication, the author believes to be due to the late Sir Antony Carlisle, who, in a letter addressed to Sir Gilbert Blane, on blisters and rubefacients, published in 1826, describes an instrument adapted to these several purposes; and, in the November number of the Philosophical Magazine, addressed to the editor a letter on the same subject. In 1829, M. Mayor of Lausanne published a small essay, *sur la Cauterization avec le marteau*, in which he shows that, by means of this instrument, the effect either of a mustard poultice or a blister, or even of moxa, may be on the shortest notice produced. Trousseau published afterwards an Account of Experiments made by the hammer of Mayor. The method, nevertheless, does not appear to have attracted much attention.

In 1845, Dr Corrigan published an account of several cases very successfully treated by similar means. Dr Day having had occasion to try the comparative value of the counter-irritants in ordinary use, took the opportunity of putting to the test the practice of Dr Corrigan. In the mode of application, Dr Day differs slightly from that employed by Dr Corrigan; but, as the difference is unimportant, and involves no difference of principle in accomplishing the object intended, Dr Day claims no originality in the proposition. Dr Corrigan makes no reference to the writings either of Sir Antony Carlisle or M. Mayor.

The instrument employed, as most convenient, by Dr Day, is shorter and more portable than that used by Dr Corrigan. It consists of a button, or roundish piece of iron, about half an inch in diameter and one-fourth of an inch thick, attached to an iron shank, which is furnished with a small wooden handle. The shank is curved nearly at a right angle, at the distance of about half an inch from the upper surface of the button. The whole instrument resembles a very small hammer. The button is heated about a quarter of a minute in the flame of a spirit-lamp, while the end of the fore-finger is held on the curve. When the heat becomes uncomfortable to the finger, the instrument is ready for application. Dr Corrigan's method of procedure is to touch, as lightly and rapidly as possible, the surface of the part affected, at intervals of half an inch. Dr Day has usually found it of more service by drawing very tightly the flat surface of the heated button over the affected part, so as to act on a greater extent of surface. The cuticle is never raised, and the only visible effect is a slight degree of local redness, either in lines or in circular patches, according to the mode in which the instrument is applied.

In the paper by Dr Corrigan, that physician relates one case of paralysis of the upper and lower extremities, cured by applying the button daily for about three weeks along the spine, thighs, and legs; cases of lumbago, and other forms of aponeurotic and muscular rheumatism, of sciatica, of neuralgia of the fifth, and paralysis of the seventh pair of nerves.

Dr Day, in like manner, relates cases of lumbago, sciatica, and neuralgia, cured speedily and effectually by the application of this agent.

We have no doubt that the remedy is a good one; yet it is not new. It is merely the cautery proposed and employed by Cottugno of Naples in 1764, which that physician found so efficient in the treatment of sciatica, and which has been since that time unduly neglected. It seems to be of no great moment by what means the iron is heated, provided it is heated.

It is true that it is not made red and glowing, and thereby perhaps the pain of the radiant heat and the apprehension of a formidable object are obviated. The difference, however, is only in degree.

IV. SURGERY.

Opacity of the Cornea removed under the use of Iodide of Potassium and Mercury. *By* M. J. BATEMAN WILSON (*Guy's Hospital Reports,* Second Series, Vol. vi. Part I. p. 53. October 1848).—It is well known that opacity of the cornea is often a most intractable disorder, and when once established, is incapable of being removed, so that the patient is either blind or nearly so. It hence also happens, that for few diseases of the eye have a greater number of remedies been proposed, and hence the treatment is too often irregular, empirical, and such that its certainty can never be depended on. Mr J. Bateman Wilson found that, under the use of iodide of potassium with blue pill, the disease disappeared in the following case.

A young woman, aged 21, applied to Mr Wilson for assistance for the removal of an affection of this kind, on the 4th May 1842. She stated that when at Harrowgate in August 1841, she felt dimness in one eye, with intolerance of light, and some catarrhal symptoms, which she ascribed to having slept in a damp bed a few days previously, on her journey to Harrowgate. The dimness gradually increased; and in three weeks the other eye became affected in a similar manner. She then applied to a surgeon, and was under his care till the beginning of October, without any improvement. About this time she went to Westmoreland, and during her residence there her eyes got so much worse, that she could scarcely distinguish any object except day from night. About the end of October, through the liberality of a nobleman, she was sent to London to be under the care of an eminent oculist, who ordered blisters, strong lotions, and tonics. After ten weeks of this treatment she experienced no benefit, and returned to the country. On the journey from London to Stamford, in Lincolnshire, in the beginning of January 1842, her vision was so much impaired, that she could not tell how many persons were in the coach. At Stamford, she was six weeks under the care of a surgeon without relief. She left Stamford on the 23d March for Whitehaven, in the vicinity of which town her father resided. In the country she remained four months, occasionally led about by friends for exercise, yet without any amendment in the sight, which she now despaired of recovering. On the 4th of May she consulted Mr Wilson, who found the corneæ of both eyes quite opaque, the iris being quite concealed; the conjunctiva of the sclerotic and eyelids vascular; the appearance delicate, and indicative of strumous habit; the tongue loaded at the base; the bowels said to be regular; catamenia scanty; the pulse small and quick.

Mr Wilson ordered two grains of iodine with ten grains of iodide of potassium to be dissolved in six ounces of water, and of this solution the patient to take one table-spoonful three times daily. Half a drachm of blue pill mass, one scruple of rhubarb, and five grains of ipecacuan, were directed to be formed into twenty pills, two of which were ordered to be taken on alternate nights. The patient was allowed nutritious diet, without stimulants.

On the 31st of May the corneæ were clearer at the circumference, and the patient was able to distinguish large objects. Half a grain of iodine was added to the mixture; and a lotion of sulphate of zinc, eight grains to three ounces of water, was ordered to be used. On the 20th of June the opacity was diminished, and the patient, though unable to discern small objects, was able to read large characters, as the leading titles of a newspaper. Another half grain of iodine was added to the solution, so that it now contained equivalent to three grains to the six ounces. The blue pill and rhubarb pills were continued; and around the eyes belladonna was applied. On the 20th of July very little opacity of the corneæ remained; and the patient was able to distinguish distant objects. On the 3d of August the corneæ were quite clear; the patient was able to read small printed characters, and saw objects as well as at any period of her life.

After this time the health continued good, and the eyes free from disease.

From this case the author draws two inferences: 1st, That iodine is very efficacious in removing the effects of inflammatory action of long standing; and, 2d, That opacity of the cornea may be removed without the strong lotions recommended by ophthalmic writers.

The author has seen several cases similar to that now related; and while in all those which were subjected to the treatment pursued in the earlier stages of this case, the progress was invariably tedious,—when the iodine was employed, disappearance of the opacity was speedily, and in general easily effected.

V. MISCELLANEOUS.

Report on the Mortality of Edinburgh and Leith, for the months of September, October, and November 1848. By James Stark, M. D., F. R. C. P. E.—The mortality of Edinburgh during the months of September, October, and November 1848 amounted to 1608,—721 being males, 833 females, and 54 still-born. The mortality of Edinburgh during the corresponding months of the years 1845, 46, and 47, was respectively 953, 1263, and 1805.

The mortality of Leith and Newhaven during the months of September, October, and November 1848 amounted to 485,—219 being males, 241 females, and 25 still-born. The mortality in Leith during the corresponding months of the years 1845, 46, and 47, was respectively 135, 258, and 256.

During September the mean temperature was 53·94 Fahr., and the range of temperature 41 degrees,—76 being the highest, and 35 the lowest noted during the month. The mean temperature, therefore, was 3 degrees higher than the mean of September last year, and the range of temperature 6 degrees greater in amount. South and south-west winds were more than usually prevalent during the first three weeks of September, while easterly winds blew almost constantly during the last week. It is important to note, that during the last week of September the air was overloaded with moisture, and the air felt hot, close, heavy, and irrespirable; and there was more or less constant damp mist, relieving itself every now and then in heavy showers. Indeed, the whole rain during the month, amounting to 1·45 inches, fell within the last week of September. The daily range of temperature during this week, instead of amounting to 18 or 20 degrees, which is about the average here, never exceeded 6 degrees.

During October the mean temperature was 46·72 degrees, being nearly 2 degrees lower than during October of last year; while the range of temperature amounted to 36 degrees, being from 28 to 64 degrees. The quantity of rain which fell was excessive, amounting to 4·56 inches. The air was constantly damp and overloaded with moisture; and, from the want of evaporation and of a sufficient range of temperature, especially during the first week, the atmosphere felt hot, close, and oppressive. South and south-west winds were more than usually prevalent during the month.

During November the mean temperature was 40·31 degrees, or nearly 5 degrees below the mean temperature of November of last year. The monthly range of temperature was unusually small, being only 28 degrees, 25 being the lowest, and 53 the highest noted in the shade during the month. The quantity of rain which fell amounted to 2·42 inches; and the month was characterized by the excessive prevalence of damp fogs, great atmospheric moisture, and south-westerly winds.

As it is interesting to compare the mortality here with that occurring in other towns of Britain, the following table is drawn up for the purpose of exhibiting the comparative mortality of different towns during the third quarter of the years 1846, 1847, and 1848. The calculations of the mortality in the English towns are based on the Registrar-General's "Returns of the Mortality in 117 Districts of England for the Quarter ending 30th September 1848." The Greenock returns I owe to the kindness of John H. Tuelon, Esq. of Greenock.

TABLE I.—Proportional Mortality of different Towns during the Third Quarter (ending 30th September) of the years 1846, 47, and 48.

Places.	Mortality of Third Quarter, 1846.	Mortality of Third Quarter, 1847.	Mortality of Third Quarter, 1848.	Percentage of mortality in 1848, with that of 1846.	Percentage of mortality in 1848, with that of 1847.
England and Wales,	51,405	49,479	43,445	— 18·32	— 13·88
London, .	12,601	13,187	13,503	+ 7·15	+ 2·39
Birmingham, .	1,623	1,161	1,009	— 60·85	— 15·06
Carlisle, .	281	279	165	— 70·30	— 69·09
Liverpool, .	2,946	5,669	2,189	— 34·44	—113·28
Manchester, .	2,354	2,783	1,779	— 32·32	— 56·43
Wolverhampton,	687	774	483	— 42·23	— 60·23
Edinburgh, .	1,201	1,729	951	— 26·18	— 81·80
Leith, .	247	241	214	— 15·42	— 12·61
Greenock, .	238	546	256	+ 7·56	—113·28

Note.—The — mark in the above table denotes that the mortality of 1848 was below that of the years 1846 or 1847 by the amount specified. The + mark denotes that it was greater.

This table, then, shows that the mortality in all the above-named places, with the exception of London and Greenock, was less during the third quarter of 1848 than during the corresponding period of the years 1846 or 1847. In Greenock, though the mortality of the third quarter of 1848 is slightly above that of 1846, it is no less than 113 per cent. below the mortality of 1847; the high mortality of 1847 being caused by the influx of Irish to that seaport.

With the last day of September terminated the improvement of the public health both in Edinburgh and Leith. On the 1st of October the Epidemic Cholera made its appearance at Newhaven, a fishing village to the north of Edinburgh, in North Leith parish; and on the 2d, the first cases of that disease occurred in Edinburgh. By the 30th of November, to which date this report alone extends, 534 cases were reported by the police as having occurred in Edinburgh, of which 276 were stated to have proved fatal; and 329 cases in Leith and Newhaven, of which 139 were said to have died. As the cases were reported very irregularly at first, these numbers only give an approximation to the truth; but if the proportion of deaths is accurately stated, we can calculate from the actual deaths which occurred, and which are registered in the Edinburgh and Leith Mortality Tables, the number of cases in Edinburgh and Leith up to the 30th of November. On the supposition that the mortality of the unreported cases was the same as those reported, seeing that 296 deaths are registered as occurring in Edinburgh, and 181 deaths in Leith and Newhaven, 572 cases of cholera must have occurred in Edinburgh, and 464 cases in Leith and Newhaven, during October and November. Assuming these numbers as approximations to the truth, they show that, during October and November, one case of cholera occurred out of every 245 inhabitants in Edinburgh; but to the extent of one case out of every 59 persons in the population of Leith and Newhaven. In Loanhead, again, a village to the south of Edinburgh, about one case of cholera occurred out of every 20 inhabitants.

EDINBURGH.—As atmospheric agencies appear in Edinburgh to exert a stronger influence on the public health than in most other places, attention has naturally been much directed to this point. Previous to and during the first week of the outbreak of cholera here, almost exactly the same kind of weather prevailed, though in a milder degree, as prevailed immediately before and during the outbreak of influenza last year. In my last year's report it was noticed that the atmospheric conditions which appeared to give rise to that disease were excessively mild, damp relaxing weather, with the air overloaded with moisture, followed by sudden changes to frost, which gave rise to the formation of dense wetting fog or mist. Now, without intending to assert that cholera is produced by atmospheric causes, it is certainly curious to notice, that the weather, during the last week of September and the first week of October, was of an excessively relaxing kind, being very close, very mild, and the air so damp and overloaded with moisture, that the slightest change of temperature gave rise to the formation of a thick, damp fog or mist. When these changes were more sudden or greater in degree, the mists passed into thick, drizzling, and most wetting rain, occasionally even into heavy and continuous torrents of rain. In fact, a close heavy mist hung over the town most of these two weeks, only partially clearing off during bright sunshine, and the quantity of rain which fell during that period was unusually great. During all this period the range of temperature was extremely small, averaging only four degrees daily,—never exceeding six degrees within the 24 hours. The contrast with our ordinary weather was therefore very striking, indeed, the air felt hot, thick, heavy, and irrespirable.

From the moment of the setting in of this weather, diarrhœa and derangement of the bowels became exceedingly prevalent, and on the 1st of October the first case of cholera occurred at Newhaven, and on the morning of the 2d October two cases occurred in Edinburgh.

Whatever influence this weather had on the cholera, or on its manifestation here, certain it is, that from that period the mortality of all classes of disease largely increased. In fact the unknown epidemic influence giving rise to cholera, which was generated by, rendered virulent, or arrived along with this kind of weather, had precisely the same effect on the general mortality which the arrival of the epidemic influenza, with its analogous weather of a more severe type, had on the general mortality of last year. Both fearfully increased the prevalence and aggravated the fatality of the prevailing epidemics (typhus fever last year, scarlet fever and cholera this), while they increased the general fatality of all diseases. Thus during the past months, with the advent of the epidemic influence, the general mortality in Edinburgh, excluding still-births, rose from 350 which it was in September, to 516 in October, and to 688 in November. The mortality of epidemic and contagious diseases rose from 151, which it was in September, to 290 in October, and to 398 in November. It is thus apparent that epidemic influence not only largely increases the mortality of that class of diseases on which it may be supposed to have most influence, but also largely increases the deaths from all causes.

These facts will be illustrated by the following table, in which is stated the number of deaths in Edinburgh and Leith during the months of October and November 1845–6, 7, and 8. There was no prevalent epidemic influence here during 1845 or 1846; but that of influenza was present in 1847, and that of cholera in 1848.

	1845.	1846.	1847.	1848.
Edinburgh,	607	801	1249	1204
Leith,	87	147	153	396

One conclusion seems fairly deducible from these facts, and that is, that damp foggy weather accompanying, following, or alternating with very mild, close, damp, relaxing weather, during which the air is overcharged with moisture, is invariably followed by a greatly-increased mortality; and it depends on circumstances of which, as yet, we have no knowledge, whether such weather introduces or gives rise to influenza or cholera.

During the above three months the mortality of the zymotic (epidemic, endemic, and contagious) class of diseases greatly increased. Thus during August the deaths from this class of diseases numbered 115 only; during September, chiefly in consequence of the increased mortality during its last week, the deaths from zymotic diseases amounted to 151; while during October they rose to 290, and during November to 398. Not only the actual but the proportionate number of deaths from zymotic diseases increased since the advent of the epidemic influence. Thus the deaths from zymotic diseases amounted to 37 per cent. of the total deaths during August, to 43 per cent. of the total deaths during September; but rose in October to 56 per cent., and in November to 57 per cent. of the total deaths.

Typhus fever cut off only 81 persons during the above three months, a proportion not much greater than the average quarterly mortality of that disease. Scarlet fever, on the other hand, which has been excessively prevalent, has proved fatal to 313 persons during September, October, and November. Indeed Edinburgh has not witnessed such a severe epidemic of this disease since the autumn and winter of 1835–6. Of the deaths from scarlet fever, 150 were males and 163 females. Of these, 20 were under one year of age, 45 between 1 and 2 years, 153 between 2 and 5 years, 80 between 5 and 10 years, 10 between 10 and 15 years, and 2 above 15 years of age. Small-pox proved fatal to 31 persons during the above months. Of these, 27 were ascertained not to have been protected by vaccination; of the others, one was reported to have been vaccinated; nothing was ascertained with regard to the remainder. Measles and Hooping-cough, as is usual during the prevalence of scarlet fever, have been exceedingly rare during the above months, but during November they have exhibited a slight tendency to return. Should this continue, it may be looked on as a favourable change, and as indicating a tendency in the present epidemic influence to abate.

There is one circumstance connected with the relative prevalence of measles, hooping-cough, and scarlet fever as epidemics, which is worthy of note, inasmuch as their relative prevalence last year and this corroborates the acute remarks of Noah Webster relative to the phenomena of epidemic periods. As the results of the numerous facts which he has most industriously collected, he pointed out that certain epidemics followed in the wake of one another, observing to a certain extent a regular order. For instance, that measles and catarrhs were usually the harbingers of epidemic influenza, followed by scarlet fever, which was the usual precursor of plague, fluxes (cholera ?) and dysenteries. It will be recollected that, previous to the outbreak of influenza, measles and hooping-cough prevailed as epidemics. As these three diseases, influenza, measles, and hooping-cough, all affect more or less the respiratory mucous membranes, it is quite reasonable to conclude that they are in some way connected with the same or analogous epidemic influences. Scarlet fever, and the anginas which attend it, on the other hand, more especially affect the mucous surfaces and organs connected with the upper portion of the organs of digestion; while cholera, dysentery, and diarrhœa are severe affections of the lower portions of the same organs. It is quite possible, therefore, that these last diseases are also in some unknown way connected together, so as to be under analogous epidemic influences. In any case, as these epidemics have occurred in Edinburgh in the same exact order as Noah Webster pointed out they had done in many previous epidemic or pestilential periods, it is right that attention should be directed to the subject, with the hope of its throwing some light on that most inscrutable of all diseases—Cholera.

The deaths from Diarrhœa were more numerous during September than during either October or November,—a circumstance which may be accounted for partly by the diminished tendency to bowel complaints during the colder months of the year, partly perhaps to the greater attention which was paid to checking the disease in its early stages during these latter months, lest it should lead to cholera, also perhaps to several of the cases of diarrhœa passing into cholera.

Though cases of Dysentery were common in Edinburgh, especially during the month of October, few proved fatal, though for the most part they proved more rebellious to treatment than in ordinary seasons.

Cholera, during the two months it has prevailed here, has proved the most fatal of the epidemics, cutting off 297 persons in Edinburgh, from the 2d of October. This disease has selected its victims almost entirely from among the inhabitants of those parts of the town most in need of sanitary measures. Almost all the old and favourite haunts of typhus fever have furnished their quota of cholera cases; indeed, it is quite remarkable how very closely the sites of cholera, typhus fever, and dirt, are identical. During the progress of the disease several of the known facts regarding it were observed. At Newhaven it was for a considerable time confined to one side of a narrow lane before it attacked any of the inhabitants on the opposite side. Many cases occurred in which intoxication passed into cholera; indeed, intemperance seemed to be one of its chief predisposing causes. At first, almost every case had premonitory diarrhœa; and at Newhaven almost every inhabitant suffered from that disease during the prevalence of cholera. Later in the disease the persons were at once struck down without any previous warning. Generally speaking, the disease showed itself to be non-contagious, though a very few instances did occur in which it is difficult otherwise to account for its extension to the healthy. It, however, showed a most distinct tendency to localize itself in particular situations, of which many very remarkable instances occurred. It was when the disease showed this tendency to localize itself that temporary removal of the whole inhabitants from these localities to houses of refuge was found of the utmost utility in arresting the further progress of the disease; indeed, when this was not done, the family continued to be mowed down successively by the pestilence. Though many remarkable instances of this occurred here during the progress of the epidemic, one only need be noticed. One case of cholera occurred in a lodging-house, and the authorities wished to remove the remaining 14 inmates, but they refused. They were all successively attacked, and most of them died; whereas, of 110 persons taken to the house of refuge, only one person was attacked, and his extremely intemperate habits sufficiently accounted for his falling a victim to the prevailing epidemic. The removal of the family from the infected locality arresting the further progress of the disease is of itself a tolerably strong argument in favour of the non-contagious nature of the disease. Had it been contagious, they would have carried the contagion with them, and propagated the disease in their house of refuge; whereas none of the removed parties, so far as I am aware, with the above single exception, were affected with the disease.

This fact of the localization of the disease certainly goes far to support the view of those who hold that cholera is produced by some miasm or local exhalation from the earth. But it must be apparent to all that something more is needed than simple miasm to excite this disease, else why does this miasm only give rise to cholera at long and distant intervals, while during other years the miasm from the same soil gives rise to, or favours the generation of, typhus fever or other epidemic diseases? It is scarcely conceivable that the miasm from the soil or locality should differ much one year from another, though it may vary in intensity; and though cholera in its march seems by preference to attack those places which are situated on the banks of rivers, or on badly-drained ground, or are in a bad condition as to cleanliness, around which filth is allowed to accumulate, or which are exposed to the emanations arising from open ditches, drains, &c., and more especially when the inhabitants are uncleanly in their habits, are in want of the necessaries of life, and are addicted to intemperance,—yet, as all these causes may be in operation for years without the outbreak of cholera, it is manifest that a something more is needed to give rise to the disease. This something more may fairly be inferred to be an atmospheric cause, as I shall now shortly endeavour to show.

Whenever, during the progress of the epidemic, unusually mild and damp, close, relaxing weather occurred, and was followed by any change, but especially by a change to frost, so as to cause the formation of a damp fog or mist, the cases of cholera increased in numbers, in some cases were more than doubled. Such weather occurred in a very marked degree during the last 3 days of October and first 4 days of November, after which frost set in. Much rain fell during this period, the air was surcharged with moisture, and fogs or mist were almost constant. From the 4th to the 10th of November we had more or less frost every day, attended with cold cutting winds and occasional falls of snow. It was during this period, viz. from 28th October to 7th November, that cholera attained its height of severity in Edinburgh,—the cases rising from 9 on the 26th October to 20 on the 28th, and ranging from 14 to 20 till the 7th of November. They remained most steadily at their maximum during the frosty days which followed the damp relaxing weather. This connection, however, of weather with the epidemic was most marked on the 30th of November, the very day, be it recollected, when last year the mortality attained its utmost height under the influence of the epidemic influenza. The 29th of November was an unusually mild, damp, close day; the 30th was a bitter cold day, with a keen south easterly wind, excessive dampness, and a tendency to frost. The number of cases on the 29th of November was 6, which was the daily average for a whole week previous. On the 30th of November the cases rose suddenly to 18. These facts then show that atmospheric agencies have fully as much to do with the origin and progress of the disease as local miasms; and, instead of dogmatically asserting that either one or other is the most probable, it seems much more philosophical to conclude—indeed the facts allow no other conclusion to be drawn—that both are necessary for the production of the disease. It is right, however, to confess, that the causes of the disease seem still to be wrapped in inscrutable mystery.

With regard to the nature of the disease, or its treatment, it does not appear that we have advanced one step beyond the knowledge we acquired in 1832. Nothing could ever induce me to believe that the structural lesions of the bowels and other organs, on which such stress was laid in 1832, had any necessary connection with the disease. My own impression then was, and still is, that cholera consists essentially in a vitiated state of the blood, induced by the unknown poison which produces the disease. It 1832 it was ascertained by Dr Christison and others that the blood drawn in that disease contained a notable quantity of urea, less water than healthy blood, and consequently a larger proportion of albumen, colouring matter, and salts. My own experiments on the blood of cholera patients in 1832 were performed with the simple view of ascertaining the proportional quantities of the different solid constituents to one another and to the whole blood. Urea or salts were not sought for; but in other respects my analyses corresponded generally with those of Dr Christison. It was, however, found, that during and before the stage of collapse, the proportion of fibrin relative both to the albumen and to the red globules, was notably less than in healthy blood, though the actual proportion to the volume of blood was nearly the same as in health, in consequence of the blood having lost a large proportion of its watery particles. Blood drawn, however, after the fever of reaction had set in, always exhibited a notable increase in the proportion of fibrine above the standard of healthy blood, whether as compared with that of the albumen and red globules, or of the whole mass of the blood. As it was found, by a long series of direct experiments and observations, that the proportional quantity of fibrin to the other solid constituents of the blood could be readily, almost instantaneously, increased by blood-letting, the conclusion was arrived at, that blood-letting, or any other agent which could increase the proportion of fibrin, would be found to be the most efficacious remedy in cholera; and nothing has occurred during the present epidemic which has induced me to alter my opinion. Nay, more, it is understood that blood-letting has proved the most efficacious of all the modes of cure yet attempted in the hospital here. Of 12 selected cases so treated, only 1 died.

As might be expected, relative to an epidemic disease which has shown such a strong tendency to localize itself, females have been attacked by cholera in much greater numbers than males. This result is probably produced partly in consequence of their being more exposed to the local cause, whatever it be, from being more constantly at home; partly also because the natural changes incident to the female constitution during the whole middle period of life, render them more easily affected by the poison of cholera. Whatever be the cause, of 542 cases reported in Edinburgh during the months of October and November, 181 were males, 322 females, and of 21 the sex was not stated. The deaths registered in Edinburgh, Leith, and Newhaven during the same period shows the same fact. Thus, 116 males and 181 females died from cholera in Edinburgh during that period; while in Leith and Newhaven there died 73 males and 108 females. The following table, showing the sexes and ages of the persons dying of cholera during October and November, will illustrate these observations.

Ages.	Edinr.		Leith.		Ages.	Edinr.		Leith.	
	M.	F.	M.	F.		M.	F.	M.	F.
under 1 year	3	1	0	0	40 & under 50	16	26	11	19
1 & under 2	4	8	2	2	50 60	11	21	5	15
2 5	11	6	6	6	60 70	9	8	2	9
5 10	8	9	12	4	70 80	1	3	0	3
10 15	1	5	1	1	80 90	1	0	0	0
15 20	2	4	2	3	Age not stated	8	21	2	8
20 30	19	39	16	12					
50 40	22	35	14	26	Total,	116	181	73	108

This table, then, shows that cholera cuts off the chief portion of its victims at the same ages as typhus fever, viz. between the ages of 20 and 60 years. It also bears out the statement above made, that the monthly changes of the female constitution during the whole middle period of life, render them more liable to be attacked than males;—a circumstance rendered more apparent by the fact, that during the earlier stages of life, viz. from birth to 15 years of age, that disease proved more fatal to males than to females. Thus, during the above months, 48 boys under 15 years of age died of cholera in Edinburgh and Leith, but only 37 girls under the same age.

The mortality of diseases of the Brain during September, October, and November, was greatest during September, and least during November, the mortality from these diseases diminishing with the diminution of temperature; again illustrating what was remarked during the earlier months of the year, when the mortality of these diseases increased with the increase of temperature.

Diseases of the Respiratory Organs, on the other hand, increased with the diminution of temperature, the mortality therefrom being lowest in September and highest in November. The deaths from these diseases numbered 37 during September, 59 in October, but 69 in November.

The mortality of diseases of the Heart and Blood-vessels appeared to be under the same influences as diseases of the respiratory organs, being at a minimum during the mild month of September, and at a maximum during the ungenial month of November.

Diseases of the Organs of Digestion, excluding of course the epidemic bowel complaints, scarcely varied in their fatality during the above three months; the deaths therefrom amounting to 45 during both September and October, and 51 during November.

The deaths registered under the head of Old Age were most numerous during the month of November, the first setting in of the cold weather being always remarked to be pernicious to the aged.

Leith.—The above remarks, relative to the mortality of Edinburgh, apply nearly equally to that of Leith during the above months. There, however, in consequence of the much greater proportionate prevalence of cholera, the mortality during October and November rose to a much greater proportionate height. Thus the mortality of Leith during October and November 1848 was no less than 355 per cent. higher than the mortality of the corresponding months of 1845; 169 per cent. above the mortality of the corresponding months of 1846; and 158 per cent. above the mortality of October and November 1847.

The following is the abstract of the mortality tables of Edinburgh and Leith for the months of September, October, and November 1848, classified according to ages and diseases.

Table II.—TABLE OF AGES—1848.

Ages.	Edinburgh.						Leith.					
	Sept.		Oct.		Nov.		Sept.		Oct.		Nov.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
1 year and under,	23	30	37	26	32	30	6	4	8	10	15	6
2	19	22	22	30	20	27	4	4	8	5	8	3
5 ...... -	27	34	51	49	51	48	5	7	9	16	14	10
10	14	18	31	23	27	36	1	1	7	8	11	8
15 ...... -	3	7	5	9	6	5	1	2	3	2	2	2
20	4	2	5	5	4	13	1	1	2	2	3	2
30 ...... -	13	8	17	16	40	50	1	1	12	6	6	11
40	15	15	20	30	27	39	6	2	12	22	13	15
50 ...... -	22	3	16	23	26	36	2	2	9	12	10	14
60	10	16	19	22	23	35	4	3	8	12	5	11
70 ...... -	12	10	12	18	20	20	1	1	4	7	4	8
80	7	9	7	13	11	17	1	1	6	2	2	6
90 ...... -	2	2	3	3	6	4	0	0	1	0	0	1
100	0	1	0	0	0	0	0	0	0	0	0	0
Not stated -	1	1	2	2	9	26	0	2	3	2	1	7
Total deaths,	172	178	247	269	302	386	33	31	92	106	94	104
Still-born, -	10	12	5	4	12	11	4	2	6	5	6	2
Total, -	182	190	252	273	314	397	37	33	98	111	100	106
	872		525		711		70		209		206	

TABLE III.—CLASSIFIED TABLE OF DISEASES—1848.

Class.	DISEASE.	EDINBURGH.			LEITH.		
		Sept.	Oct.	Nov.	Sept.	Oct.	Nov.
I.	Small-pox,	8	8	15	0	0	0
	Measles,	5	0	9	1	1	0
	Scarlet fever,	78	130	105	16	18	22
	Hooping-cough,	5	12	14	4	5	0
	Croup,	2	3	4	0	6	0
	Diarrhœa,	15	10	7	0	6	1
	Dysentery,	3	4	1	0	1	1
	Cholera,	2	86	211	0	86	95
	Typhus fever,	24	31	26	7	17	10
	Erysipelas,	4	5	4	0	1	1
	Other zymotic diseases,	5	1	2	0	1	0
II.	Dropsy,	8	9	15	0	0	2
	Cancer,	2	2	2	0	2	0
	Debility,	5	8	10	1	2	5
	Other diseases of uncertain seat,	4	7	13	2	1	0
III.	Cephalitis,	1	0	3	1	0	0
	Hydrocephalus,	11	15	5	3	6	1
	Apoplexy,	6	7	3	3	0	0
	Paralysis,	14	8	8	2	2	2
	Other diseases of brain,	8	4	9	1	1	1
IV.	Pneumonia,	1	11	12	0	2	1
	Asthma,	0	4	8	0	0	1
	Consumption,	31	34	42	6	7	11
	Other diseases of respiratory organs,	5	6	7	0	0	2
V.	Diseases of heart and blood-vessels,	4	8	10	0	2	0
VI.	Teething,	14	14	3	2	3	1
	Inflammation of bowels,	17	10	30	2	2	5
	Tabes mesenterica,	10	12	15	2	5	3
	Other diseases of organs of digestion,	4	9	3	1	3	1
VII.	Kidney and urinary diseases,	2	2	1	0	0	0
VIII	Child-birth,	5	6	9	0	2	2
	Diseases of uterus, ovaries, &c.,	0	0	2	0	0	0
IX.	Rheumatism & dis. spine, joints, &c.,	2	0	5	3	0	1
X.	Ulcer, carbuncle, &c.,	1	0	0	0	0	0
XI.	Old age,	21	22	40	1	8	6
XII.	Violent deaths and suicides,	14	14	13	4	4	4
	Causes not specified,	9	14	22	2	4	19
	Total deaths,	350	516	688	64	198	198
XIII	Still-born,	22	9	23	6	11	8
	Total,	372	525	711	70	209	206

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PART I.

ORIGINAL COMMUNICATIONS.

Art. I.—*On Steatosis; or Adipification of Muscle.* By C. H. Hallett, late Demonstrator of Anatomy in the University of Edinburgh.

In a former number of this Journal (No. 174), when describing the anomalies of the muscular system which had been observed in the bodies dissected in the practical rooms of the University of Edinburgh during the years 1846–1847, I had occasion, in the general remarks, to allude casually to a very remarkable instance of steatosis, or adipification of muscle, which had fallen under my notice at the commencement of the winter session of the latter year. Since that time, I have observed and carefully examined other instances of this pathological condition of the muscles, both in the human subject and in one of the lower animals. I therefore take this opportunity of redeeming the promise I then made the readers of this Journal to describe the case, and, at the same time, to notice the nature and general characters of the transformation, at least as far as my own observations and those of some of the continental pathologists will admit.

William Speed, aged 78, died of paralysis on the 8th day of December 1846. A few days after death, the body was transmitted to the University for dissection, the encephalon having been removed at a *post-mortem* examination. He appeared to have been, during his life-time, a strong robust man; the chest was large and capacious, the limbs bulky and firm, and, as far as it was possible to judge from external appearances, the whole muscular system seemed more than usually well developed. The removal of the superficial textures, however, immediately dispelled the previously-formed opinion of the fitness of the subject for dissection, since all the muscles of the back, the part first dissected, could not be distinguished by their colour; the fibrous character of some structures composed almost entirely of fat, and the direction or course of the fibres alone indicated the position of, and the lines of demarcation between, the various muscles in the whole of the dorsal region. On turning the body, the muscles on the upper part of the trunk were found in precisely the same condition. All the muscles in the body were subsequently examined in detail, and but few were found that had entirely escaped the fatty deterioration.

Some of the muscles had been apparently entirely transformed into adipose tissue. Others had been only partially transformed, many of these having three-fourths or more of their muscular appearance destroyed; the remaining portion, although wearing a fleshy aspect, presented very evident indications of the process of adipification being in full force up to the time of death. A few retained more of their normal appearance, in consequence either of a small portion only having been converted into fat, or of the adipose matter having distributed itself equally and comparatively in small quantity throughout the whole muscle, giving it a peculiar mottled aspect. I shall, therefore, in noticing the case in detail, first enumerate those muscles which had been wholly converted into fat, and then enumerate those which had undergone only a partial adipification, in each region of the body.

1*st*, In the back, the face, and region of the scalp, all the muscles, with the single exception of the *latissimus dorsi*, which was only partially changed, were apparently completely converted into adipose substance.

2dly, In the anterior cervical region, the only muscles which were observed to have undergone any appreciable transformation were, the *recti antici majores* and *minores;* the *longi colli*, and the *scaleni antici* and *postici;* and these had been completely transformed.

3dly, In the region of the trunk, the muscles which had been wholly converted into fat were the pectoral muscles, both greater and lesser, on each side; the *serrati magni*, the *triangulares sterni;* the diaphragm, both external obliques; and, on the right side only, the *psoas magnus* and *quadratus lumborum.* Those partially transformed were the intercostals, both external and internal, the fatty matter being distributed in small patches throughout their whole length; the *recti abdominis*, the whole lower four-fifths of which were wholly transformed, while the upper and remaining fifth presented some small patches radiating upwards; the internal obliques, all below the level of the anterior superior spinous process of the ilia in both being unchanged; the *transversi abdominis*, the superior third of that on the right side, and the lower half of that on the left side of the abdomen, being, for the most part, unaltered; and, lastly, the pyramidales and cremasters, which were dotted over with fat, and presented the peculiar mottled appearance of muscles infested with the *Trichina spiralis.*

It may be necessary to remark in this place, in connection with this extensive deterioration of the muscles of inspiration, that it was in this subject the highly-developed, robust, and fleshy *rectus sternalis* or *sternalis brutorum* muscle, which I have described in the number of this Journal referred to, at the commencement of this memoir, existed, and was, in this instance, the principal, perhaps the only, agent by which the chest was expanded in the act of inspiration.

4th, In the upper extremities, the muscles apparently wholly transformed were the *triceps extensor*, the *biceps flexor*, and the *brachialis anticus* in both arms; the biceps, on being cut transversely, presenting some remains of its fleshy hue in the centre of the section; the *supinator longus*, the *extensor carpi radialis longior* and *brevior*, and the *anconeus* in both fore-arms; the *extensor communis digitorum* and the *extensor indicis* in the right fore-arm only; and in the hand, the whole of the palmar muscles of the thumb and little finger. Those partially transformed were the deltoid, and all the muscles about the scapula inserted into the upper part of the humerus, in both shoulders; the *flexor carpi radialis* and *palmaris longus* in both fore-arms; the *flexor carpi ulnaris* and *flexor profundus digitorum* in the right fore-arm, and the *extensor ossis metacarpi pollicis* in the left fore-arm. In all the last named muscles, the exterior had been wholly converted into fat; but on being divided, more or less of the centre was distinctly fleshy, and the characters of muscular fibre were easily detected. The *flexor carpi radialis* formed the only exception to this rule, the upperpart of this muscle only being changed, and that in such a manner as to present the appearance of a conical cylinder of fat being applied on a pyramid of muscle.

5th, In the inferior extremities, the muscles wholly transformed were observed to be, in each hip, the *glutæus maximus* and *medius*, the *quadratus femoris*, and the two *gemelli*; the *biceps flexor cruris*, the *semitendinosus* and the *semimembranosus* in the posterior region; the *quadriceps extensor* and *triceps adductor cruris*,—with the exception of the *adductor longus*, which was normal in every respect,—in the anterior region of both thighs. Those partially transformed were found to be the *iliacus internus*, the *obturator externus* and *internus* on both sides of the pelvis, all of them being mottled over with fat; the *glutæus minimus*, which, on the right side, presented its lower half changed, and on the left side had its anterior two-thirds curiously streaked with fat; the *pectineus*, studded with adipose substance over its whole extent; and all the muscles of the posterior region of the leg, including the *poplitæus* and all those of the sole of the foot, without exception, these muscles presenting the same peculiar appearance as the *pyramidales* and *cremasters* in the trunk.

None of the involuntary muscles were changed in an appreciable degree. The heart, which is usually classed amongst these, but presents the same ultimate structure in the *fibrillæ* as the voluntary muscles, formed an exception to this rule; its surface being not only more loaded with fat than ordinary, but its substance being also infiltrated with adipose matters to near the inner surface of its several cavities, where the fleshy appearance was still retained.

Before entering on the more minute details of this case, or attempting to describe the general nature and course of the process of adipification of muscle, it is necessary that I should place before the reader those cases which have been recorded by others, and which, from their extent, and the peculiarities presented by them, have enabled me, in conjunction with those observed by myself, to deduce some general laws which appear to regulate the change.

The case which appears to approach most closely to that just described, at least in extent, is one observed and recorded by Dumas. On examining the body of a man who had died under fever accompanying catarrh, he found all the muscles on the anterior aspect of the chest, together with those on the posterior part of the region of the shoulder and of the arm, changed into fatty matter, and surrounded with a sheath of condensed areolar tissue, which affected the form and figure of the muscles whose place it occupied. Some others of the muscles, as those of the abdominal walls, and the *triceps extensor cruris*, announced, by an alteration in their colour and consistence, that, although the transformation was by no means complete, the process of adipification was going on in them. The *glutæus maximus* and first adductor of the thigh were also partially converted into fat, but they still presented some muscular fibres scattered through the mass of adipose matter.

Vicq-d'Azyr, after mentioning that he had seen two slight cases of fatty transformation of muscle, describes, with his accustomed care and minuteness, an instance of extensive change in the muscles of the inferior extremity of an old subject which he had dissected. With the exception of the *glutæus maximus*, which retained its natural fleshy appearance, all the muscles in the left lower extremity were observed to be pale and more or less completely converted into fat. The superior portion of the *semitendinosus* and of the *biceps flexor cruris*, the *gastrocnemius*, the extensors of the toes, including that of the great toe, and the *tibialis anticus*, were the only muscles in which marked traces of fibres could be found. All the rotator muscles of the thigh, those placed in front of the femur, the *iliacus internus* and the adductor muscles, as well as those of the sole of the foot and the posterior region of the leg, were apparently wholly converted into fat, so much so, that it was difficult to discover any vestiges of their fibres in the position they normally occupy. On examining the *sartorius*, between its two points of attachment, the successive degrees of the process of transformation were observed, the gradual transition from muscle to fat being clearly discernible; the lower part of this muscle was so completely transformed as to be scarcely distinguishable from the fat about the knee. The man on whose body this observation was made, had been a cripple some years before his death.[*]

Maugre, on amputating the thigh of a young man for an ununited fracture of three years and a half's standing, discovered all the muscles of the leg, as he relates, totally converted into fat, the only exception being the *gastrocnemius*, which still retained some fleshy substance nearly the size of the thumb. He also states, that, on dividing the muscle, he could clearly trace some red fibres in their interior.[†]

In his great work on pathological anatomy, Cruveilhier relates a case of fatty transformation of the muscles of the leg, in connectian with club-foot, of many years' standing. He discovered the *tibialis anticus*, the long common extensor of the toes, the proper extensor of the great toe, the short extensor of the toes, the long flexor and the accessory flexor of the toes, together with the proper flexor of the great toe, completely transformed into fat. The *gastrocnemius* and *solæus* were observed to have been only partially transformed, the internal head of the former and the outer half of the latter still preserving much of their fleshy appearance.[‡] Cruveilhier also mentions that he had seen other cases of the same kind.

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[*] Œuvres de Vicq d'Azyr; par Jacq. L. Moreau, T. 5, p. 365. Sur une éxtremité inférieure dont les muscles ont été changés en tissu graisseux, sans aucune altération dans la forme exterieure.

[†] Journal Général de Médécine, T. 24, p. 6. Rapport sur une observation relativement a une dégénération de la presque totalité des viscères de l'abdomen; et observations sur la transformation des différentes parties du corps humain, par F. T. Double.

[‡] Anatomie Pathologique du corps humain, Vol. i. livr. 11, p. 3, pl. 111. Examen anatomique des muscles, des ligaments, &c.; dans le pied-bot.

Louis also, on dissecting the amputated lower extremity of a subject, observed that the *gastrocnemius*, the *solæus*, the *plantaris*, the *poplitæus*, the long common flexor of the toes, the proper flexor of the great toe, and the *tibialis posticus*, were converted into adipose substance.*

Lastly, in a woman who had died shortly after bearing a child, Emmanuel, who was obliged to make the examination by stealth, observed the muscles forming the abdominal parietes completely converted into fat.

Besides the cases brought together in this memoir, others, more or less extensive, have been seen and mentioned by Salzmann, Leuwenhoeck, Albinus, Haller, and many other anatomists; but I am not aware that they have given any detailed account of their observations.† I may here state, that the other instances of this pathological condition of the muscles in the adult human body which have fallen under my notice, were, first, almost complete transformation of the muscles in the anterior and external region of the leg in connection with club-foot, the fleshy hue being only discernible in the interior of the muscles; secondly, partial transformation of all the muscles of the leg, consequent on ankylosis of the knee-joint and disease of the tarsal bones; and lastly, complete transformation of the deltoid muscle, probably resulting from injury of the circumflex nerve from dislocation of the head of the humerus into the axilla. In none of these cases, however, was there any other peculiarity noticed worthy of especial mention.

From the observations hitherto recorded, it would appear that the fatty transformation of muscle is strictly confined to that kind of muscular fibre called striated, comprising all the muscles of animal life, and the heart, which is also ranked from its mode of action, amongst the involuntary muscles, or muscles of organic life. Kerkring, Bonet, Morgagni, Cruveilhier, Laennec, and Adams‡, have all seen and described examples of fatty transformation of the muscular substance of the heart. In all these cases, as well as my own, the fatty matters had been deposited, for the most part, in the fibres towards the surface of the several cavities, the inner fibres and the *columnæ carneæ* being free from fat, and possessing their normal appearance; and it may be stated in connection with this, that, whenever the heart is found to have undergone the fatty transformation, it will be found to conform in every respect to the general rules regulating the process in the so-called voluntary muscles, with which it corresponds in structure, and that it offers the best place to follow the various stages of the change, as hereafter described.

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* Journal Generale de Medecine, t. 24, p. 5.

† Vide Œuvres de Vicq d'Azyr, loc. cit., and Journal General de Medecine, loc. cit. Salzmann is described as having seen muscular fibres converted into a fatty mass. Leuwenhoeck is cited by Haller as having seen not only the muscles but the tendons also adipified. Albinus, after describing the muscles in general in his work, "De musculorum Hominis," says, "Pinguidine ita distenditur aliquando ut reliqua musculorum sufficet: tendines vero pinguidina tam facile non cedunt;" implying that he had observed the change.

‡ Vide Essai d'Anatomie Pathologique, Vol. 1, p. 183: and Craigie's Pathological and General Anatomy, art. Steatosis.

The lower animals are not altogether exempt from this morbid state of the muscles, for fatty muscles have been detected in more than one instance in the sheep. Vaughan records an extensive change in the muscles of a sheep which he dissected,* and I have lately had an opportunity of examining it in the muscles of the back of a sheep, which was stated to have had all the muscles in its body transformed into fat;—a portion of this last instance is amongst the stock preparations of the museum of the Royal College of Surgeons of England. From the observations I have made on this specimen, I am enabled to state that the process of transformation appears to follow precisely the same course as in man.

Haller has recorded his opinion that the muscles in monsters are not unfrequently found more or less fatty.† That the muscles are often replaced by compact fat, bound down by and intermixed with much condensed areolar tissue, in monsters presenting great defect and deformity, is well known to those anatomists who have devoted much time to teratological studies, but whether such a change occurs in monsters by excess or redundance may well be questioned. Although I have dissected numerous monsters by excess, I have never been able to detect the slightest trace of fatty transformation of the muscles; and although I have noticed fat replacing the muscles in monstrosities by defect, I have never been able to satisfy myself that muscular fibre had ever existed where the fat was found.

Adipification of muscle is the result of various diseases, which prevent the due exercise, and consequently interfere with or pervert the nutrition of one or more of the muscles in any or several of the regions of the body. Amongst the most extensive and most powerful in effect of such diseases, confirmed paralysis, proceeding from disease of the nervous centres, ranks first, and rachitis, when the deformity consequent on it is extensive, and the interference with motion is great, ranks next in order. Club-foot, ankylosis, and unreduced dislocation, when of long standing, are not unfrequent causes of it. Paralysis from direct injury to the trunk of a nerve has caused it. According to Cruveilhier, it not unfrequently is the result of old ulcers, when of great extent, of long standing, and where they materially interfere with the motion of the diseased limb. It has also been stated that the muscles of the calf of the leg and *erector spinæ* muscles undergo fatty transformation in old people, from disease of the limbs or other causes. My own observations, however, on such cases of alleged transformation, show that it is in general, if not always, an entirely different change from that under consideration.*

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* Some Account of an Uncommon Appearance, &c. London, 1813. A highly speculative essay on alteration of the muscles in the Strood sheep. I may quote here the following words, as bearing more directly on the subject under consideration:—"On minute examination, no vestige of fibre could be discerned, but only minute particles, the figure of which it was impossible to ascertain." Some of the muscles in the cervical region were not wholly converted into fat.

† In morbis rarum, in monstris vulgare vitium est. Vicq d'Azyr also dissents from this conclusion of Haller, on the ground that fatty muscle is but rarely seen in any case; but this, perhaps, is also as far from the truth.

Whatever disease may be the cause of the transformation, it may be laid down as a general rule that, in all cases, the process of adipification of muscle is extremely slow in its progress, and that it requires considerable length of time for its full completion. From numerous careful examinations of muscles, in which the deposition of adipose matters was found in its slightest degree with the microscope, I have been enabled to determine that the fat is first traceable within the sarcolemma, where it is found in minute globules closely packed together, and arranged for the most part in linear series. In this stage of the process there may be also occasionally seen a few perfect fat corpuscles, enclosed within the sarcolemma, filling up its entire breadth, and sometimes causing it to bulge outwards on either side. The fat globules and corpuscles are highly refractive, and appear as dark spots of various sizes; they can be easily discerned with an achromatic lens magnifying 250 diameters. Whether the fat globules are contained within the myoline, or whether they merely displace it, cannot be satisfactorily determined, at least I have not been able to satisfy myself on this important point. One thing, however, appears certain—namely, that there is in this stage of the process no appreciable diminution in the amount of myoline; for, on treating a small portion of the muscular fibre presenting the above appearances with sulphuric æther in an animalcule cage or compressorium (to prevent rapid evaporation), the fat globules and corpuscles are soon dissolved out, and the ultimate fibril is found to retain its normal appearance in as far as the eye can distinguish.

If a portion of muscle, in which fat has been deposited to the extent of about an inch be examined with the microscope, the adipose corpuscles and globules, the former more especially, will be found to have greatly increased in number within the sarcolemma, in those parts of the fibrillæ which have undergone most complete transformation, while but few can be detected near those parts in which the process of transformation has only just commenced. Again, if the portion of fatty muscle under examination be macerated in ether, or submitted to the action of boiling alcohol for some time, and then re-examined, the fat corpuscles and globules will be found to have almost entirely disappeared, and but few of the corpuscles characteristic of muscle will be observed where the fatty matters were most abundant; they have for the most part disappeared, or, more likely, have entirely changed their character. In this stage of the process of adipification, fat globules and corpuscles can be detected sparingly distributed in the meshes of the areolar tissue connecting the fibrillæ and fibres together.

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* It is to be remarked, that steatosis or adipification of muscle results from an entirely opposite condition of the system which appertains to fevers and other wasting disease, and therefore any hypothesis which may be advanced to explain the nature of the change must be based on this difference. In this memoir I have purposely abstained from all hypotheses, and confined myself strictly to facts.

The gradual deposition of adipose substances can be traced proceeding onwards, in this way, from one end of a fibre or fibrilla to the other, or from its centre towards either extremity, the fat corpuscles becoming relatively more numerous as the transformation goes on, both within the sarcolemma and in the meshes of the areolar tissue connecting adjoining fibrillæ together. When the deposition of fat has advanced to its greatest extent,—in other words, where the muscle is apparently wholly converted into fat, there being no marked traces of muscular fibre visible to the naked eye,—myoline, although in extremely small quantity, is still capable of being detected by the microscope. It is not uncommon to find the sarcolemma ruptured, and one or more fat corpuscles protruding from it; that this is not always the result of the manipulation with the needles necessary to prepare the fibre for minute examination, is shown by the fact that it seldom occurs or is met with in fibres which have not been wholly transformed; and also by its sometimes being impossible to trace the sarcolemma for any great distance, in consequence of its being completely broken up and destroyed; so that we must ascribe the rupture to a diminution of the elasticity and power of coherence of the sarcolemma consequent on the deposition of fat both within and around it,—an effect which is well known to follow the accumulation of fat beyond its normal quantity in any texture. The only other change worthy of mention where the muscle appears wholly transformed, was observed to be a greater relative amount of fat globules around the fasciculi of fibres; but this would appear to be the result of the breaking up of the sarcolemma in adjoining fasciculi at least to a great extent.

It is this stage of the process of adipification of muscle which Vicq d'Azyr undoubtedly intended to describe in his comments on the case, of which an abstract has been given in this memoir.*

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* Loc. cit.

Considering the time at which he wrote, and the imperfect instruments for minute observation at his command, his description is of sufficient interest to be transcribed here, more especially as it shows that he was fully aware of the first site of the change. He observes, "on pressing a portion of altered muscle strongly, a large quantity of fat, differing in no respect from that found in other parts of the body, is expressed. On examining such a portion of muscle with a lens of high magnifying power, it presents an assemblage of soft transparent fibres, the diameters of which differ in different parts of their length, and which in certain fibres appear to be divided into a great number of small compartments. When the fibres are carefully separated from one another, their organization is in part destroyed, and the lens exposes to view the whitened laminæ which connected them, and in each interstice a little fatty matter which pressure has caused to escape." And again he states emphatically, it is not between the fibres that the fatty matters are deposited, but within the elements of the fibres themselves.*

This statement of Vicq d'Azyr is adopted by Cruveilhier,† who proceeds to observe that the muscles at first present their natural aspect, only they are somewhat paler than ordinary,—the linear disposition of their fibres being always evident. A muscle in such a state may not be pronounced at first sight to be fatty, but on making a section of the muscle, and pressing it against linen or bibulous paper, an evident oily stain is made. Such a mode of examining a muscle supposed to have undergone adipification, however, is sometimes fallacious, and can never be relied on.

The question as to what part of the ultimate structure of the fibrillæ is the first seat of the change, is one which cannot, in the present state of our knowledge of the minute anatomy of muscle, be answered in anything like a satisfactory manner. We first detect the fatty matter within the sarcolemma; but whether it is deposited within the cells of the myoline and these become fat cells, or whether it is deposited in the spaces between the cells and these are removed as the quantity of fat is augmented, cannot be fully determined. Analogy would lead us to presume the former; for other organs, in undergoing the process of fatty transformation, have the adipose matters first deposited within the cells, which form the most essential part of their structure. In the liver the fat is first detected within the biliary cells, and spreads from them to the surrounding interstitial substance; and, in true fatty degeneration of the kidney, the fat is first deposited in the secreting cells in the uriniferous tubes. This, taken in connection with the facts, that fat globules are distinctly traceable within the sarcolemma without any appreciable diminution in the myoline, in the first stage of the process of adipification, and that myoline afterwards disappears in direct proportion to the increase of fat within the sarcolemma, would tend to sustain the hypothesis, that the ultimate cellular structure of muscle is the primary seat of the change. Could this be demonstrated satisfactorily, we should be able to propound a law of general application to true fatty transformations.

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* Op. cit. Ce n'est point entre les lames que le tissue graisseux paroît être épanché, mais bien entres les élémens de la fibre ellemême.

† Essai l'anatomie pathologique. Paris, 1816. Vol. I, p. 185.

The microscope shows that the transformation of muscle into fat takes place slowly; and this is also clearly demonstrable to the naked eye. We are also almost invariably able to demonstrate another fact, which, from the numerous statements and descriptions of those who have recorded cases, deserves to rank as a general law. I allude here to the very remarkable, but altogether inexplicable circumstance, that the circumference or surfaces of a muscle undergoing fatty transformation are always first converted into fat; in other words, that the adipose matters are first deposited in the outermost fibres, and subsequently in those towards the centre. In consequence of this, a muscle which at first sight appears to have been wholly converted into fat, on being divided, exhibits, where the transformation has not proceeded to its greatest length, more or less of unchanged muscular fibre in the centre. This is best seen in the long muscles of the extremities; but the flat muscles, as those of the anterior abdominal walls, the muscles of the chest, the trapezius and serrati, also follow the same law; for when not wholly adipified, the fat is observed to extend over and involve a greater extent of the external than of the internal fibres, although in by no means so marked a degree as in the muscles of the extremities.

Another circumstance connected with the adipification of muscle seems also worthy of special mention, namely, that the deposition of adipose matter, and the absorption or removal of the true muscular substance, appear to proceed "pari passu;" so that, on a muscle being apparently converted wholly into fat, there is no evident or appreciable diminution in the bulk, nor any alteration in form or figure of that muscle. On comparing muscles which are adipified with others in the same or opposite extremity, or side of the body, which are wholly free from fat, the eye can detect no difference, except in regard to colour. All the cases noticed by myself exhibited this in a most marked manner; and others, as Vicq d'Azyr and Cruveilhier, make distinct mention of it in their description of cases. Atrophy of a muscle, therefore, would not appear to be a result of adipification, as some pathologists have supposed; for the smaller size and atrophied appearance of the transformed muscles in cases resulting from club-foot, ankylosis, old ulcers, and other causes arising from local changes or diseases, are explicable, on the ground that either congenital deformity has interfered with the growth, or acquired deformity or disease prevented the proper nutrition of the muscles, before they had undergone adipification. Besides, it is to be remembered that the muscles are not always diminished in size in cases of muscular adipification accompanying or resulting from acquired deformity; and, consequently, the conclusion that, where muscles are atrophied, the wasting away of the muscular substance has preceded and is independent of the deposition of fat, is perfectly correct.

There now remains but one other point in the physical history of this pathological condition of the muscles to be noticed. The colour of the muscles, if they may so be called when adipified, is changed into either a dirty clay or a lemon colour, according to circumstances which are not fully understood. The adipified muscles in young subjects, appear to me to be of a much deeper yellow hue than those of old subjects. It may be remarked here, that fatty muscles offer considerable resistance to the scalpel on dividing them; almost as much as when they are in their normal state.

Chemical analysis shows fat to be present in considerable quantity. The following abstract of a detailed analysis of fatty muscle by Cruveilhier is highly interesting, inasmuch as it strongly confirms the fact, elicited also by the microscope, that muscular tissue still exists in small amount in muscles which have apparently been converted wholly into fat. A muscle with its tendons weighing one ounce and seven drachms, on being cut into small pieces and macerated in cold water, gave half a drachm of oily matter. On boiling the residue for two hours, and submitting it to a strong pressure, it was reduced to a greyish substance weighing a drachm and a half, and resembling a portion of boiled muscle. The water being filtered and evaporated, four grains of gelatine were procured. The oily matter on the filter was found to contain four grains of crystalline fat, said to resemble adipocire, an ounce and two drachms of solid fat, and sixty-four grains of oily matter extricated by alcohol.* Had the above analysis been made with the tendons removed from the muscle, we should have been better able to appreciate the nature of the residual mass resembling boiled muscle. The analyses which I have made of portions of fatty muscle destitute of tendon and aponeurotic fibre, coincide in a great measure with that given by Cruveilhier, and they enable me to state that perhaps not more than one-half of the residue procured by him ought to be placed to the account of the

* Essai, &c. Vol. i. p. 188.

muscle. A portion of the *pectoralis major*, weighing one ounce avoirdupois, gave only two scruples of substance not fatty; and but forty-six grains of residue were obtained by me from a like amount of the *rectus femoris*, the rest being fat.

Gluge reports that he has obtained salts from fatty muscles in rachitic subjects, and Cruveilhier states that the fat obtained from adipified muscle is more inflammable than other fats; but I am not able to confirm his statement.

In conclusion, it is necessary for me to notice briefly two conditions of muscle which may be, and undoubtedly have been, mistaken for true adipification. The first is not unfrequently found in old decrepit individuals, and consists in the deposition of fat in the areolar tissue connecting together the fibres of the muscles. I have often seen this in the muscles of the back and of the calf in old persons, but never true adipification; for I have always failed to detect fat *within* the sarcolemma in such cases, and this we have seen to be the first and great change in the fatty transformation of muscle.[*] The second is seen both in young and in old subjects, especially in the lower part of the trapezius and the rhomboid muscles. It consists in the loss of the usual fleshy appearance of the muscles, and, according to my observations, is almost always associated with defective development of the altered muscles, the fibrillæ being smaller and paler, but still preserving their elemental structure unchanged. It was perhaps from the examination of instances of this last source of error, that Beclard was led to deny the occurrence of steatosis.

ART. II.—*Contribution to an Account of the Diseases of the North American Indians.* By THOMAS STRATTON, M.D. Edin.; L.R.C.S.E.; Memb. Toronto Medico-Chirurgical Soc.; Memb. Montreal Natural History Soc.; Corresp. Memb. Quebec Literary and Historical Soc.; Hon. Memb. Highland Soc. of Canada; Surgeon R.N.; late Surgeon to the Chippawa Indians of Lake Huron.

HAVING been stationed in Canada for ten years, and part of this time at places, where I had opportunities of seeing many Indians, and of occasionally treating their diseases, I think that it may be a not unacceptable contribution to the scanty literature of this subject to offer a few remarks on the diseases of the North American Indians. I resided for nearly four years at Penetanguishene, and other parts of Lake Huron; and on the 29th of December

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[*] Cruveilhier and Bichat have also pointed out the necessity of distinguishing this change from true fatty transformation of muscle.

1846, by the Governor-General (Earl Cathcart), I was appointed "medical attendant to the Beau Soleil Indians, and to the Chippawa Indians of Lake Huron, and Simcoe who reside near Penetanguishene."

The Indian department in Canada is managed by a superintendent-general, an assistant-superintendent (George Vardon, Esq.), who reside in Montreal, two visiting superintendents, and four or five stationary superintendents, who reside at Manitoulin, Brantford, and other places. At Brantford, Orillia, Penetanguishene, and Manitoulin, there are regular yearly salaries paid to surgeons for attending the Indians. Land belonging to the Indians is very properly not allowed to be bought from them direct by private persons, as this would lead to constant imposition on the aborigines, but it is purchased from the government, and the proceeds of the sale set apart for the benefit of the Indians—to pay the salaries of the superintendents, surgeons, clergymen, schoolmasters, &c.,—to build houses, and to procure blankets, guns, powder and shot, which are annually issued. There is also the sum of L.15,000 annually voted by the British Parliament for the purchase of blankets and other presents to the Indians; but it is not unlikely that this grant will soon be discontinued.

There are a few remarks on the state of medicine among the Indians in the first volume of Dr Rush's Medical Inquiries and Observations,* and also in Douglas's Medical Topography of Upper Canada.†

Report I.—From my friend Mr Vardon, I received a copy of the medical report of the Six Nations Indians, living on the banks of the Grand River, Lake Erie. The surgeon to these Indians is Alfred Digby, Esq., who resides at Brantford, and whose report I take the liberty to subjoin. The Six Nations Indians are composed of the tribes of the Cayugas, Senecas, Mohawks, Delawares, Mississaugas, and Tuscaroras, and they amount to 2200 in number.

Number of sick among the Six Nations Indians treated from 1st March 1847, to 1st March 1848.

Intermittent fever, ...	142	Bleeding from various causes,	51
Bilious, intermittent, and remittent fever, ...	48	Teeth extracted, ...	91
Scarlatina, ...	13	Diarrhœa and dysentery,	31
Measles, ...	27	Constipation, ...	5
Erysipelas, ...	5	Enteritis, ...	13
Encephalitis, ...	5	Liver-complaint, ...	3
Ophthalmia, ...	18	Vermes, ...	22
Phthisis, ...	4	Hæmorrhois, ...	12
Pneumonia, ...	9	Retention of urine, ...	2
		Gonorrhœa, ...	44

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* Philadelphia, 1789; and second edition, Philadelphia, 1805.

† London, 1819, page 120.

Stricture, ...	5
Primary and secondary syphilis, ...	11
Childbirth, difficult cases,	8
Burns and scalds, ...	5
Wounds, from fighting and accidents, dressed, ...	28
Amputation of leg, after frost-bite, ...	1
Amputation of fingers, mangled in a thrashing-machine, ...	1
Partial amputation of foot, after the same accident,	1
Frost-bitten ears, hands, and feet, ...	19
Children vaccinated, ...	84
Total cases, ...	718

Report II.—The following is Mr Digby's return of the total number of deaths, and causes of death, among the Six Nations Indians, from 1st March 1847 to 1st March 1848.

	Deaths.
Fevers, bilious, remittent, &c., ...	23
Encephalitis, ...	1
Erysipelas, ...	1
Phthisis, ...	4
Enteritis, ...	1
Liver-complaint, ...	4
Children from fits caused by worms, ...	7
In childbirth, from malformation of the pelvis,	1
Intoxication and exposure to cold, ...	4
Syphilis, ...	1
Drowned by the upsetting of a canoe, ...	2
Old age, ...	2
Murdered by other Indians,	2
Total deaths, ...	54

Here, in fifty-four deaths, there are two from old age. Fifty-four deaths in a population of 2200, is between twenty-four and twenty-five in a thousand.

These Indians are far advanced in civilization; they have in a great degree given up their hunting habits; they have schools, churches, and farms. Some of them, however, continue heathen, and at Cayuga have annually a sacrifice of a white dog. They are surrounded by a white population, and so are exposed to the influence of vicious example, which accounts for there being so many cases of a certain disease. The marshy banks of Grand River are very unhealthy in summer and autumn, malarial fevers then being very general. I spent several seasons at Dunnville and Port Maitland, on Grand River, and gave a short account of their medical topography in the sixty-first and sixty-third volumes of this Journal.*

The returns which follow relate to the Indian establishment on Great Manitoulin Island. This is a large island in Lake Huron

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* Edinb. Med. and Surg. Journal, April 1844, p. 392; April 1845, p. 327; and July 1845, p. 105.

(140 miles from Penetanguishene), where there is a Protestant settlement at Manitouwawning, the residence of the superintendent, surgeon, Episcopal clergyman, schoolmaster, and of about 200 Indians. Four miles distant is the village of Wequemekong, where reside a Roman Catholic priest and about 600 Indians. These Indians in general profess to be either Catholics or Protestants, but a few continue heathen. They cultivate maize or Indian corn, potatoes, wheat in small quantity, and prepare maple sugar. They also engage in fishing. There is now but little hunting. The exports of the island are maple-sugar and potatoes.

Annually, in August, there is a great assemblage here of Indians from the west and north. They come to receive presents of blankets, provisions, guns, and powder and shot. Many who are not to receive presents also attend in order to see their friends and acquaintances. In 1845, I was at Manitoulin at the time of the distribution of presents; the scene was a very animated one; on the steep bank of a large bay were numerous wigwams (huts) of bark, and along the shore were hundreds of bark canoes. From my friend Captain George Anderson, the superintendent, I obtained the numbers of Indians who attended and received presents in the under-mentioned years: in 1839, the number of Indians was 3304; in 1840, 5057; in 1841, 3874; in 1842, 5812; in 1843, 3771; in 1844, 1887; and in 1845, 1852.

Up to 1843 inclusive, presents were given to some branches of the Ottawa and Chippawa tribes, and other Indians, who usually resided in what is now the United States; but in 1844, the presents to United States Indians were discontinued. The visiting Indians remain on the island for four or five weeks, and then move off in their canoes to their respective hunting grounds, or more usual places of abode. The resident Indians here are chiefly Chippawas and a few Ottawas; the visiting Indians also are chiefly of the above clans, and also include Menomenies, Ponowatomies, and some other tribes. With my friend Paul Darling, Esq., the surgeon of the Indian department here, I went into a number of the wigwams seeing cases of illness. From Mr Darling, I received copies of his medical reports for several years. I afterwards received the same reports from Mr Vardon of the Indian Office, Montreal.

Report III. Mr Darling's Medical Report of the Manitoulin Indians for ten months, from 10th October 1840 to 16th August 1841.

Fever, ...	21	Paralysis, ...	2	Ophthalmia, ...	9
Ephemera, ...	2	Neuralgia, ...	10	Catarrh, ...	18
Headach, ...	6	Hydrocephalus,	3	Cynanche, ...	28
Epilepsy, ...	4	Deafness, ...	1	Bronchitis, ...	10
Hypochondriasis,	1	Snow ophthalmia,	4	Pneumonia,	1

Hæmoptysis,	2	Gravel,	1	Malignant nasal polypus,	1
Epistaxis,	1	Gonorrhœa,	10		
Syncope,	2	Venereal bubo,	1	Scrofula,	2
Palpitation,	2	Abortion,	2	Scabies,	19
Laryngitis,	1	Amenorrhœa,	10	Prurigo,	2
Varicose veins,	1	Leucorrhœa,	2	Psoriasis,	1
Teeth extracted,	54	Prolapsus uteri (half breed),	1	Porrigo,	15
Vermes,	16			Contusion,	6
Ranula,	1	Procidentia ut. (half breed),	1	Burn,	1
Vomiting,	2			Abscess,	17
Constipation,	16	Menorrhagia,	4	Debility,	3
Diarrhœa,	30	Acute rheumatism,	5	Wounds,	15
Difficult dentition,	11	Chronic do.	32	Mumps,	1
Aphtha,	8	Pleurodyne,	6	Enlarged glands,	13
Colic,	4	Lumbago,	10	Paronychia,	2
Dyspepsia,	6	Sprain,	2	Ulcers,	2
Icterus,	1	Dislocation,	1	Boils,	12
Tympanites,	2	Fractured arm,	1	Prickly heat,	1
Enteritis,	3	Diseased spine,	6	Inflamed nipples,	7
Hæmorrhois,	1	——— shoulder,	1	Dysentery (during the issue of presents),	47
Marasmus,	3	——— wrist,	1		
Harelip,	1	——— ankle,	3		
Peritonitis,	1	Ankylosis,	1		
Nephritis,	2	Tumour,	1	Total,	573
Dysuria,	3				

cases, exclusive of those (dysentery excepted) treated during the issue of presents. The subject of the case of hypochondriasis was a woman, who had been long in a hypochondriac state, and she committed suicide by drowning.

Report IV.—Mr Darling's Medical Report of the Manitoulin Indians for sixteen months from 16th August 1841 to 31st December 1842.

Cases treated.

Fever,	14	Ophthalmia tarsi,	13	Phthisis,	12
Intermittent fever,	6	Congest. of brain,	2	Catarrh,	52
Ophthalmia,	32	Amentia,	1	Hæmoptysis,	1
Encephalitis,	2	Croup,	1	Teeth extracted,	68
Neuralgia,	14	Aphonia,	1	Lientery,	2
Sciatica,	5	Bronchitis,	4	Diarrhœa,	42
Hydrocephalus,	3	Chronic bronch.,	19	Dysentery,	46
Concussion,	3	Pneumonia,	3	Constipation,	28
Earache,	14	Cynanche,	28	Hepatitis,	2
Paralysis,	2	Wounds of chest,	4	Vomiting,	10
Epilepsy,	6	Pleuritis,	7	Colic,	12

Ascites, ...	1	Procidentia uteri,	1	Psoriasis, ...	1
Dyspepsia, ...	6	Inflamm. of labia,	1	Porrigo, ...	13
Difficult dentition,	28	Acute rheumatism,	3	Erysipelas, ...	1
Ulcerated throat,	5	Chronic rheumat.	40	Burns, ...	7
Vermes, ...	21	Pleurodynia,	3	Wounds, ...	20
Tape-worm,	2	Lumbago, ...	6	Inflammation of mamma,	4
Gall-stones,	1	Sprain, ...	2		
Gonorrhœa,	8	Exostosis, ...	1	Abscess, ...	11
Dysuria, ...	1	Periostitis, ...	1	Lumbar do., ...	1
Hæmaturia, ...	1	Paronychia,	2	Mammary do....	2
Retention of urine,	1	Diseased spine,	4	Boils, ...	8
Gravel, ...	1	——— shoulder,	1	Debility, ...	3
Amenorrhœa,	4	——— hip,	2	Marasmus, ...	6
Difficult labour,	1	——— knee,	4	Aneurism, ...	1
Menorrhagia,	1	Contusion, ...	23		——
Dysmenorrhœa,	1	Ulcers, ...	10	Total,	726

cases, exclusive of cases of hooping-cough, of which no account was kept, and also of cases treated during the issue of presents, during which time, from four to six weeks, there is scarcely time to note the cases. The cases of ague were imported; they occurred in Indians on their return from visiting Detroit,—a malarious part of the country. In the original report are included three cases of parturition and one of hypochondriasis, all occurring in whites, and which I have accordingly omitted.

Report V.—Medical Report of the Manitoulin Indians for twelve months, from 1st January 1844, to 31st December 1844.

Cases treated.

Fever, ...	47	Asthma, ...	1	Dysuria, ...	1
Scarlatina, ...	10	Pleuritis, ...	8	Post-scarlatinal anasarca, ...	5
Intermittent fever,	1	Inflamed mamma,	2		
Deafness, ...	8	Syncope, ...	1	Spina bifida,	1
Earache, ...	17	Teeth extracted,	76	Menorrhagia,	2
Phrenitis, ...	3	Difficult dentition,	20	Amenorrhœa,	2
Hypochondriasis,	1	Aphtha, ...	10	Lumbago, ...	7
Neuralgia, ...	24	Vermes, ...	19	Diseased spine,	2
Paralysis, ...	4	Dyspepsia, ...	4	——— hip,	1
Sciatica, ...	13	Liver-complaint,	1	——— knee,	5
Ophthalmia,	30	Diarrhœa, ...	48	——— ankle,	1
Cynanche, ...	43	Dysentery, ...	18	Sprains, ...	26
Catarrh, ...	62	Constipation,	36	Periostitis, ...	1
Bronchitis, ...	24	Colic & vomiting,	14	Fractured ribs,	1
Hæmoptysis,	4	Hernia, ...	1	Wounds, ...	21
Phthisis, ...	4	Cholera infantum,	32	Contusion, ...	26
Hooping-cough,	7	Gonorrhœa, ...	1	Ulcer, ...	17

*Peculiar ulceration,	2	Boils,	12	Debility,	3
Abscess,	14	Psoriasis,	1	Cataract,	1
Burns,	10	Porrigo,	42	Mumps,	1
		Marasmus,	4		
				Total cases,	803

In the original report are included six cases of parturition in whites; these I have omitted. In 1844, there was an extensive and very mild epidemic of scarlatina. In this and the other reports, under *constipation* are included all cases generally of a slight nature, where only a purgative was required.

Report VI.—Medical report of the Manitoulin Indians, from 1st January 1845, to 31st January 1845.

Cases treated.

Fever,	1	Diarrhœa,	5	Rheumatism,	3
Headach,	2	Colic,	2	Diseased elbow,	1
Clavus,	1	Lead-colic,	1	Fractured fibula.	1
Ophthalmia,	12	Prolapsus ani,	1	Contusion,	3
Earache,	2	Vermes,	1	Sprain,	3
Neuralgia,	5	Dyspepsia,	1	Elephantiasis of fore-arm,	1
Toothach,	10	Mammary abscess,	1	Paronychia,	1
Hooping-cough,	4	Inflamed nipples,	1	Lupus,	2
Asthma,	1	Prolapsus uteri,	1	Psoriasis.	1
Pleuritis,	1	Procidentia uteri,	1	Porrigo,	4
Bronchitis,	2	Amenorrhœa,	1	Boil,	1
Catarrh,	7	Menorrhagia,	1	Enlarged glands,	3
Palpitation,	2	Suppressio mensium,	1	Secondary syphilis,	1
Syncope,	2	Pelvic abscess,	1		
Constipation,	4			Total cases,	97

Report VII.—Medical Report of the Manitoulin Indians for six months, from 1st January 1846, to 30th June 1846.

Cases treated.

Fever,	27	Epilepsy,	2	Aneurism of arch of aorta,	1
Intermittent fever,	2	Bronchitis,	37	Heartburn,	3
Frontal neuralgia,	12	Phthisis,	4	Aphtha,	4
Ophthalmia,	24	Hæmoptysis,	4	Teeth extracted,	68
Earache,	2	Pleuritis,	5	Constipation,	45
Deafness,	2	Cynanche,	14	Diarrhœa,	16
Otorrhœa,	1	Pneumonia,	1	Dysentery,	3
Spinal irritation,	4	Laryngitis,	1	Lientery,	1
Nervous irritability (from fright),	1	Palpitation,	1	Colic,	8

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* See the remarks on the Ottawa Disease, *postea.*

Dyspepsia,	9
Vomiting,	3
Vermes,	12
Tape-worm,	1
Diseased spleen,	1
Marasmus,	1
Hepatitis,	1
Hæmorrhois,	2
Prolapsus ani,	2
Stricture,	1
Orchitis,	1
Salivation,	1
Hæmaturia,	1
Gleet,	1
Morning sickness,	1
Menorrhagia,	2
Amenorrhœa,	5
Abortion,	1
Sinking after labour,	1
Rheumatism,	39
Pleurodynia,	5
Lumbago,	13
Sprains,	4
Contusion,	5
Luxated wrist,	1
Fractured fingers,	1
——— fore-arm,	1
——— ribs,	1
Diseased spine,	4
——— hip,	2
——— knee,	3
Paronychia,	1
Lupus,	3
Ulcers,	9
Peculiar ulceration of Nose,	1
Nostrils,	4
Throat,	4
Arm,	2
Axilla & groin,	1
Abscess,	2
Burn,	3
Bubo,	1
Paralysis,	2
Mumps,	20
Porrigo,	13
Psoriasis,	1
Musquito bites,	2
Asphyxia (sugar in trachea),	2
Anæmia,	1
Dropsy,	1
Debility,	2
Erythema,	1
Tumour of fore-arm,	1
Wounds,	8
Total cases,	502

The Indians use an infusion of the bark of the cherry-tree for the cholera infantum, or what is sometimes called in Canada the *summer-disease*, or the *summer-complaint.*

The case of aneurism was the first one Mr Darling had seen during fourteen years' intercourse with Indians.

In all the severe cases of neuralgia, the patient had previously had ague. Unimported ague and lake-fever are unknown in Manitoulin Island.

The subject of one of the cases of peculiar ulceration of the arm was a woman; the ulceration extended from the shoulder to the fingers, one of which was nearly separated; she was reduced nearly to a skeleton. The treatment was generous diet, wine, iodine, sarsaparilla, and simple local applications; she recovered in two months. These peculiar ulcerations of the nostrils, axillæ, groins, &c., are the remains of a disease resembling the yaws of the West Indies, and the sibbens* of Scotland, and which I shall describe under the unhypothetical appellation of

THE OTTAWA DISEASE.

The disease, of which I shall now give an account, has prevailed more among the Ottawas than the other tribes, and I shall accordingly here name it the *Ottawa disease.*

After much inquiry, I cannot find that the Indians have any distinct name for it. Their name for syphilis, when translated,

* See Dr Craigie's Practice of Physic, vol. i. p. 681.

signifies *bad disorder*. About the year 1740 or 1760, it is said to have made its first appearance among the Indians around Lake Huron. A tradition exists that its first subject was a woman, from whom it was observed to spread; and in a council, it was considered whether this unfortunate female should not be put to death. The result is variously stated.

Symptoms.—The leading symptoms of this disorder are languor and lassitude; dull, almost constant pain between the orbits, and in the upper part of the nose; sometimes pain in the frontal bone, and in the malar bones; ulceration of the nostrils, and of the soft palate; a bad odour from the nostrils; sometimes destruction of the hard palate; and pains in the bones generally, increased by wet weather. Small ulcers form in the groin, on the inside of the thighs, and at times on the arms. A thick crust, an inch or so square, when removed, discloses an indolent-looking scooped-out ulcer, of no uniform shape. Sometimes an eruption appears in the groin, and on the inside of the thighs. In some cases, an extended, peculiar, indolent, scrofulous-loooking, superficial ulceration of the axillæ, groins, thighs, or arms. No particular eruption or rasp-like growth about the angles of the mouth has been observed.

My friend, Mr D., has not seen destruction of any bone except the palate; and has never seen the genital organs affected. Of the above symptoms, languor and lassitude, and the inter-orbital pain are invariably present, and some cases present no other symptom. Cases more severe, have in addition the general pains in the bones, a bad odour from the nostrils, and sometimes frontal and malar pain. An untreated slight case sometimes has remained nearly stationary for four or five years. It prevails more among females than among males; it is thought by the Indians to be communicated by the common use of pipes, spoons, and drinking-vessels. If this idea be correct, its less frequent appearance among the males may perhaps be explained by the circumstance of their being much out hunting and fishing.

In one family, the mother and her three children all had the disease; two of the children were of tender years.

I saw a family consisting of the parents and five children; one of the younger children, a girl of seven, had this disease; the other six members of the family had never had it; the parents had not had syphilis. The disease has not been seen in whites.

Diagnosis.—The Indians themselves, by merely observing the symptoms, frequently cannot tell the difference between syphilis and the Ottawa disease, but observing the effect of remedies (the *juvantia* and *lædentia*) aids their diagnosis. They consider it to be a different disease from syphilis. They call it and syphilis *twins*. The accompanying general pains are apt to be mistaken for chronic rheumatism, to which the Indians are very subject.

Prognosis.—When the disease first appeared among them, it is said to have been frequently fatal; it is now much milder (as also is syphilis), and the prognosis is favourable.

Treatment.—The Indians treat this disease with various secret herbs which are different from those they use in syphilis.

Mr D. has treated cases in the following ways:—1. Good diet; citrine ointment to the ulcers in the nostril and those of the palate; a mild course of blue pill; in other cases, Plummer's pill. 2. Nitrate of silver, either solid or in strong solution, to the ulcers of the nostril and palate; good diet; iodine and hydriodate of potass. This latter method seems to be the preferable one.

Remarks.—At first sight, one might suppose it to be not unlikely that this disease is only a variety of secondary or tertiary syphilis modified by time, by race, or it may be by some peculiar Indian treatment. But that it is not of a syphilitic character, appears likely from its appearing in young children, the offspring of parents who have never had either syphilis or the Ottawa disease. To enter at full length on the points in which it resembles, and in which it differs from, yaws, sibbens, and syphilis, would occupy too much space in this part of my communication. The opportunity of observing a greater number of cases seems necessary to enable one to form a correct idea of the real nature of this disease. I have given as full a description of it as my own opportunities of observation, and Mr Darling's information, enabled me to do, and I leave the facts to the consideration and the theories of the reader.

Report VIII.—During July 1846, among the Manitoulin Indians, there were treated fifty-two medical and surgical cases, including a case of gunshot wound, one of frontal neuralgia, two of prickly heat, one of hæmoptysis, and three of bronchitis.

Report IX.—In August 1846, among the Manitoulin Indians, there were treated thirty-two medical and surgical cases, including one of phthisis, three of musquito-bites, one of peculiar ulceration of the nostrils, and one of facial neuralgia.

Report X.—Mr Darling's Report of medical and surgical cases occurring among the Manitoulin Indians for twelve months, from 1st January 1847 to 31st December 1847.

Cases treated.

Fever, ...	76	Deafness, ...	1	Hæmoptysis,	8
Intermittent fever,	3	Cynanche, ...	26	Phthisis, ...	3
Ophthalmia,	16	Bronchitis, ...	44	Pleuritis, ...	3
Earache & otorrhœa,	3	Catarrh, ...	34	Hooping-cough,	130

Anaemia, ...	1
Aneurism of aorta,	1
Tumour of tongue,	1
Teeth extracted,	102
Dyspepsia, ...	7
Colic, ...	20
Icterus, ...	2
Hæmorrhois,	2
Amenorrhœa,	8
Menorrhagia,	1
Acute rheumatism,	5
Chronic do.	55
Lumbago, ...	14
Spinal irritation,	8
Sprain, ...	8
Contusion, ...	12
Diseased spine,	1
——— shoulder,	1
——— hip,	1
——— knee,	1
Paronychia, ...	10
Fractured fibula,	2
Amputation of great toe,	1
Wounds, ...	18
Neuralgia, ...	12
Paralysis, ...	3
Mumps, ...	3
Dropsy, ...	1
Porrigo, ...	31
Lupus, ...	2
Psoriasis, ...	1
Erythema, ...	1
Boils, ...	10
Orchitis, ...	1
Ulcers, ...	6
Debility, ...	2
Snow-ophthalmia,	3
Prickly heat,	6
Sleeplessness (from excessive use of tea), ...	1
Constipation,	112
Mal de Racquette, or snow-shoe evil,	4
Total cases,	828

None of the "fevers" were from malaria. Under *constipation*, in this and the other reports, are classed cases of slight ailment, requiring only purgative or cathartic medicine. The case of sleeplessness was in a badly-fed woman, who consumed a great quantity of green tea; the symptoms resembled a mild case of delirium tremens.

From March 1847 to July 1847, there were a great many vaccinations performed.

Hooping-cough is tedious among Indians. Acute rheumatism is rare among Indians.

In the original report there are included two cases of parturition in whites, which I have omitted.

The snow-shoe evil is a painful affection of the instep, in persons unaccustomed to snow-shoes, and after their first wearing them for a few days. It goes off in a short time with rest, &c. From Manitoulin to Penetanguishene is 140 miles, and in winter several parties travel this distance on the ice, and require usually to wear snow-shoes, as the snow is often deep. Snow-ophthalmia is apt to come on during these long journeys. In these long walking expeditions over ice and snow, to prevent blindness, the Indians sometimes use a veil. I have seen the snow-shoes stained green, which is of no small advantage, as the pedestrian is frequently looking at them. The snow-shoe, as the reader probably knows, is a light oval hoop of wood about three feet long, and eighteen inches broad in the middle; the interior is filled up with deer-skin net-work, and on its centre the pedestrian's foot is fastened and rests, and in the deepest snow he sinks only about one or two inches, from his weight being spread over a large surface.

Report XI.—Abstract of medical and surgical cases occurring among the Indians of Great Manitoulin Island, Lake Huron.

	No. of cases treated.
From 10th October 1840, to 16th August 1841,	573
... 16th August 1841, to 31st December 1842,	727
... 1st January 1844, to 31st December 1844,	803
... 1st January 1845, to 31st January 1845,	97
... 1st February 1845, to 28th February 1845,	94
... 1st January 1846, to 30th June 1846,	502
In July 1846, ...	52
... August 1846, ...	32
From 1st January 1847, to 31st December 1847,	828

Some of the above returns include cases of extraction of teeth. I have now given all the Manitoulin sick reports that are extant up to 1848; some of them were destroyed by an extensive fire at Manitouwawning; and during part of the period, various circumstances made it impossible to keep a record of the cases.

On Manitoulin Island there are four families of whites, a very few half-breeds, and the remainder are Indians. The island is about a hundred miles long; and besides the two principal villages I have mentioned,—of Manitouwawning of 200 inhabitants, and Wequemekong of 600 inhabitants,—there are two or three other villages, each containing sixty or seventy Indians. The Ottawas call Manitoulin Island by the name of Ottawa Island.

Indian Remedies.—My friend Dr Winder, in a paper in Dr Hall's British American Journal for January 1846, alludes to the five following remedies in use among the Indians:—As an astringent, the *Geranium maculatum* is frequently used in hemoptysis, diarrhœa, dysentery, and leucorrhœa, and as a styptic in external hemorrhage. In rheumatism, chronic rheumatism, and syphilis, the *Xanthoxylum fraxineum*, or prickly ash, is used with the same effect as guaiacum. The *Xanthorrhiza apifolia* is used as a tonic and as a diuretic, and its infusion is applied to inflamed eyes. The *Eupatorium perfoliatum*, according to its mode of exhibition, is tonic, purgative, or sudorific. Its cold infusion is given in ague. In substance it is tonic. Its hot infusion is employed to produce vomiting and purging, and a weak infusion is sudorific. The *Cornus florida*, or dog-wort, is used in ague. The *Polygala senega* is employed by the Indians in the remission of fevers, and in some pulmonary complaints; it is also useful in amenorrhœa.

Mr Darling informs me that, for the first three or four days after delivery, Indian women drink an infusion of the inner bark of the pine, and after that an infusion of the inner bark of the *balsam*. Their idea is that this cleanses the uterus.

The Indians have great reluctance to give any information respecting the substances they use as remedies. They have great reliance on them, and on their native physicians, often thinking as much or more of them than of regular practitioners, at least in medical cases; in cases of accidents, they are generally glad to have assistance from white practitioners; but even in surgical cases, such as gun-shot wounds, some tribes, or parts of them who are less in the habit of meeting whites, have a superstitious objection to admit any interference by a white man.

Physiology.—In his physiology, as compared with a European, the North American Indian possesses much greater perfection in his senses of sight, hearing, and smell, and in his powers of observing and remembering natural objects; also, he has much greater ability to undergo long-continued fatigue in journeys, and to endure hunger.

In several parts of the country, at Penetanguishene, Manitoulin, Sault Ste Marie, or St Mary's, &c., I made inquiries on several points respecting the usual age at which menstruation begins and ceases, the usual age at the time of marriage,* the average age of the mother at the birth of her first and last child,—and some kindred topics; but the difficulty of obtaining this kind of information can be understood only by those who have attempted it. Generally, the Indians do not know their own ages exactly, not within several years; but I believe that fourteen years is the usual age at which the menses appear. The menstrual flux is small in quantity, and seldom lasts more than two or three days. Parturition is very easy and expeditious; the lochial discharge ceases generally in less than ten days.

Children of an Indian parent on one side, and of a French or British Canadian on the other, are often or generally much finer and better-looking than either of their parents. I know a family where the father is a Scotch Canadian and the mother an Indian. There are three sons and five daughters; but no one would suppose that they were brothers and sisters. The sons, besides deriving their sex from their father, have also his ruddy European complexion, and form of features, hair, &c., and have not the least sign of Indian blood; the daughters, with their mother's sex, have acquired her reddish-dark complexion, broad countenance, dark eyes and hair, and completely Indian appearance; and instances of this kind are not uncommon.

The population of the Indian villages and settlements where they attend more or less to agriculture, is slightly on the increase; the number of individuals composing tribes or bands who attend chiefly to hunting and fishing, is considerably on the decrease. It is unnecessary to add that, of the whole Indian population, there is an annual decrease. It is sometimes said that this gradual fading away of the Indian race is the consequence of the European cultivation of their soil, and of the introduction among them of ardent spirits. But the cause which is at the root of the whole evil is simply the demand in Europe for furs. Traders go among the Indians, and, for whiskey, obtain furs; the desire of the poor Indian for the fire-water induces him to kill animals at all seasons, so that many kinds are now scarce. Formerly, he hunted and killed animals merely according as the feeling of hunger induced him, or the necessity of providing clothing or mocasins* (shoes) made him desirous of obtaining the animals' skins. Fire-water would have been unknown to the Red Man, had not the fur-trader found it his best exchange for articles of use or ornament for the ladies of Europe. After some years of reckless and indiscriminate hunting, a tract of country becomes nearly destitute of the various animals which are the objects of an Indian's chase, and this ground is consequently deserted by him. And it is chiefly on this deserted ground that the fields and farms of European cultivators are now encroaching.

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* In Canada, among the whites, I have known several instances where a female was married at the age of 14; and from 16 to 18 is very common.

The Indians are an exceedingly well-conducted and peaceable race; and at Manitoulin, in August 1845, where I saw about two thousand assembled,—a body composed of individuals from the far west and the distant north—from Lake Superior and Hudson's Bay,—the comfortable-looking Ottawa and Chippawa—the Ponowatomie dressed in deer-skins—the slim and tall Monomonie—poorer Indians, from Hudson's Bay, clothed in miserable rabbit's skins, and some with an attire of extreme simplicity and scantiness,—all these various tribes conducted themselves fifty times better than the same number of Europeans would have done.

Pathology.—Small-pox, when first appearing among them, has been very fatal, whole tribes and bands having died.

They appear to suffer nearly as much as whites from ague and remittent fever.

In epidemic scarlatina, it appeared to me that the Indians were less susceptible of an attack than the whites. Scarlatina in Indians appeared to be much less severe, and much less frequently followed by glandular swellings and dropsy.

I have not seen goitre among them, although it prevailed among other races in the same neighbourhood.

An Indian bears accidents and surgical operations much better than a European; he has less susceptibility of constitutional disturbance after them.*

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* This spelling agrees with the pronunciation. It is sometimes spelt *mocassin*. It resembles the ancient brogue of our Scottish Highlanders.

All the above differences come under the general rule that uncivilized races suffer less than civilized nations from mental and bodily ailments.

Among the Indians, there is very seldom seen any congenital bodily deformity; but during one of my visits to Manitoulin Island, on the 5th of August 1845, I was shown, by Surgeon Darling, a Chippawa boy, aged 4 years, who presented a remarkable example of congenital complete deficiency or absence of both eyeballs. The eyelids had a flattened appearance; the opening between them was very small, and no trace of an eyeball could be seen or felt; the interior was lined by a conjunctiva, which, at the time we examined it, was very red. The parents and the brothers and sisters of this unfortunate boy had nothing abnormal with regard to their eyes.

The Indians are much less subject to mental defects and diseases than nations living in a more "civilized" or artificial manner.

I must observe that if the reports from Messrs Darling and Digby had not been addressed to non-medical officials, they would, I have no doubt, have contained much additional information of great professional interest.

It would be an excellent arrangement, if each of the four surgeons employed in the Indian department sent, to the head-office in Montreal, yearly returns commencing on the 1st of January, giving the number of births and sexes; deaths, ages, and causes of death; diseases and results; and also the total number of the Indian population in their respective districts. Such reports would form a very interesting contribution to medical and national statistics.

I have been desirous of placing on record in this well-established Journal, these brief medical memoranda relating to the Indians, and I hope that they have proved interesting to the reader.

Montreal, Canada,
August 1848.

ART III.—*Statistical Researches on the Diseases of the Ear.* By Dr WILLIAM KRAMER, Berlin (Beytrage zur Ohrenheilkunde. Berlin, 1845, Archives Generales, 1847, T. 75).

THE materials from which this report has been formed, are derived from 2000 cases, which have been examined in the most attentive manner by all the means of exploration at present in use;—for instance, *speculum auris*, catheterism of the Eustachian tube, air douche, and similar contrivances. The results of examination were immediately recorded in a journal, noting, at the same time, the age, the name, and the place of abode of the patients; the date of the origin and the alleged causes of the disease; the presence or absence of *tinnitus aurium* and other symptoms; the auditory power of each ear; the treatment followed by the patient before consultation, and that prescribed by the author; its duration, and its effects.

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* Edinb. Med. and Surg. Journal, January 1846, p. 30.

All these elements of aural pathology, M. Kramer has collected in nineteen tables.

The 2000 cases of diseases of the ear examined by M. Kramer are divided in the following manner:—Five cases, or $\frac{1}{400}$ part, of disease of the *pinna;* 281, or one seventh, of diseases of the external auditory canal; 442, or one-fourth and a-half, diseases of the membrane of the tympanum; 198, or one-tenth, of diseases of the middle ear or tympanal cavity; 1028, or one-half, of cases of which M. Kramer denominates nervous deafness; and 46, or one forty-third part, of cases of deaf-dumbness.

Among the cases of disease of the *pinna* are placed 3 cases of induration with thickening, 1 erysipelas, and 1 abscess. This cypher does not represent the exact proportion of these disorders, as patients seldom request the assistance of physicians, particularly special aurist physicians, for this species of disorder.

Among 281 cases of disease of the external auditory *meatus*, 213 were examples of accumulation of wax, resulting from erythematous inflammation of the lining membrane; 51 were examples of catarrhal inflammation of this passage; 9 of phlegmonous inflammation; and 8 of *periostitis* with caries. These three last affections of the auditory meatus were accompanied by a discharge from the ear-hole; but the discharges, owing to this cause,—68 in number,—formed only a very small proportion,—that is, about one-seventh of the 510 cases of auricular discharges observed by the author; about six-sevenths were connected with inflammation of the tympanum.

[On the above statement it may be proper to observe, that the cases referred to the head of accumulation of *cerumen* or wax, are not, accurately speaking, accumulations of that secreted product. Most commonly they are a morbid product consisting of various substances,—altered wax, serum, or sero-albuminous matter, coagulated blood, sometimes purulent matter,—all mixed together. In the healthy state, the wax is moved to the outer broad end of the meatus by the frequent motions of the lower jaw; but when this secreted substance deviates from the healthy state, as it invariably does in all cases of erythematous inflammation of the lining membrane, it often adheres more or less firmly, forming a mould of the interior end of the meatus. The firmness of this adherence bears some relation to the morbid state of the membrane. If the membrane be still much inflamed, then it adheres pretty firmly. As the inflammatory state abates and is removed, the adherence of the morbid secreted products becomes feebler, and the masses are more easily detached. In some instances of this accumulation of morbid matter within the meatus, we have seen them consisting of blood, serum, and other fluids, agglutinating together into a solid mass, a considerable quantity of cotton, which the patients had been in the habit of introducing into the meatus, to protect it from cold and absorb the secreted fluids. Such accumulations always cause considerable deafness.]

The 244 instances of Diseases of the Membrane of the *Tympanum,*[*] were connected more or less closely with inflammation of the membrane. The inflammation was acute in 45 cases, chronic in 397. The diseases of the membrane of the tympanum are, therefore, twice as numerous as all the diseases of the auditory tube taken together. They form further, as already stated, six-sevenths ($\frac{6}{7}$) of all discharges which take place by the ear. Nearly one-fourth of the cases of deafness are traced to inflammation of the tympanal membrane or its consequences. In general, the *meatus* does not partake in this inflammation.

Of 198 cases of disease of the middle ear, 164 were instances of catarrhal inflammations of the mucous membrane, with accumulations of mucus; 28 were instances of inflammation, with contraction of the Eustachian tube; 2 were examples of obliteration of the same tube; and 4 were instances of inflammation, with abscess of the cavity of the tympanum. Catarrhal inflammation of the middle ear, therefore, with accumulation of mucus, formed about $\frac{1}{12}$ of the 2000 cases which fell under observation, and $\frac{4}{5}$ of all the diseases of the middle ear. This frequent prevalence of catarrhal inflammation depends less than might be imagined, on the proximity of the middle ear to the nasal fossæ and the throat, which themselves are often the seat of catarrhal disorders. Often, indeed, in ordinary coryza, a little deafness is observed to take place; but, in general, this deafness disappears with the catarrhal disorder of the nasal fossæ. It is, then, probable that in this last case, the guttural orifice only of the Eustachian tube is affected, and rarely the cavity of the tympanum itself. The disorder in hearing never continues long after the affection of the throat and nasal cavities has subsided.

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[*] The term *Membrane of the Tympanum* is used in such a manner as to be liable to ambiguity. Thus it may signify either the *membrana tympani*, namely, the oblique vertical membranous partition which is found at the inner end of the *meatus*, and separates the meatus from the tympanal cavity, or the cavity of the middle ear; or it may be taken for the tympanal membrane,—that is, the lining membrane of the tympanal cavity. In the present instance, it is applied to the *membrana tympani*. When, in the present report, the term *membrane* of the *tympanum* is employed, it means this oblique vertical membrane; when the lining membrane is meant, it shall be designated membrane of the tympanal cavity.

Contraction of the Eustachian tube rarely appears in a marked degree. In the report, from 1 to 71 in the entire number of previous cases, and from 1 to 7 among all the diseases of the middle ear, are the numbers. Complete occlusion of the tube is still more unfrequent. Inflammation, with abscess of the cavity of the tympanum, M. Kramer regards as never an idiopathic disease, except when it originates in wound or injury; and considers to be always founded in chronic inflammation of the internal membrane of the tympanum, joined with chronic inflammation, with perforation of the tympanal membrane itself.

Among 1074 cases of disease of the internal ear, 1028, or rather more than one-half of the 2000 cases treated, were referable to nervous deafness; 46 cases only were of the class of deaf-dumbness.

M. Kramer has endeavoured carefully to determine what is the frequency of different diseases of the ear, according as they affect one of these organs only, or both at once. An important observation in this point of view is, that it is impossible to trust to the statements of patients, for very often they think that they hear very well with one ear, while they hear only a little less dully than with that of the opposite side; and when they complain of a discharge by the auditory *meatus* of one side, it is necessary to explore carefully the *meatus* of the opposite side, as the discharge may be too thick and too small in quantity to escape outwardly. In other words, the physician ought never to neglect to examine attentively the degree and condition of the auditory function, and to explore all the organic conditions of the auditory apparatus of both sides.

Of 2000 cases examined by the author, 1639 were instances of twofold affection, and only 361 of the single disorder. This establishes the proportion of 4½ to 1. Of these latter 361 cases, 167 were seated in the left ear, and 194 in the right ear.

Among 5 cases of disease of the auricle or external ear (*pinna*), both ears were affected in two cases, the left ear in two cases, and the right ear in one case.

Among 281 cases of diseases of the external auditory meatus, in 165 cases the disease was seated in both ears at once, in 62 in the right ear, and in 54 in the left ear. M. Kramer remarks, regarding these diseases, that phlegmonous inflammation of the auditory tube never occupies more than one side; that inflammation of the lining membrane of this canal, or catarrhal inflammation and periostitis with caries, appear more frequently double than single,—in the proportion of 2 to 1.

Acute inflammation of the membrane of the tympanum has been observed 22 times on the right side, 21 times on the left side, and only twice on both sides at the same time.

In all other diseases of the ear, it is much more frequent to find both sides affected than one; and this is particularly remarkable as to nervous deafness, which was in 984 instances on both sides, and only in 44 cases on one side. These numbers are in the proportion of 22 to 1.

If the extreme rarity of acute inflammation of the membrane of the tympanum affecting both sides be compared with the frequency of chronic inflammation of this membrane, affecting both ears, it is evident that this last disorder, if it be sometimes developed as a consequence of the first, appears most frequently at once, and without passing through any acute stage. Every fact, then, leads to the belief, that acute inflammation of the membrane of the tympanum has little tendency to pass to the chronic state.

It is not uncommon to observe in the same individual several different affections of the ear. M. Kramer attempted to ascertain by his statistical researches, what was the proportion of these complications; and he found that in 38 cases only among 2000, or in $\frac{1}{53}$d part of the cases, one ear was affected with more than one disease; and that in 66 instances among 2000, or in the $\frac{1}{43}$d part, both ears presented two different diseases.

The diseases which are most frequently found in the same individual,'the one towards one ear, the other in that of the opposite side, are the following:—1*st*, Accumulation of cerumen in the auditory *meatus* of one side, and nervous deafness in the opposite side (in five cases); 2*d*, Chronic inflammation of the membrane of the tympanum on one side, and accumulation of mucus in the middle ear (10 cases); or nervous deafness in the other (in 18 cases.)

The diseases which are most frequently found associated in the same ear are the following:—1*st*, Accumulation of cerumen in the auditory *meatus*, and the presence of mucus in the middle ear; (this complication appeared only twice in 213 instances of the first sort, and in 164 of the second); 2*d*, Accumulation of cerumen with nervous deafness; these two disorders appeared associated in 16, among 1028 instances of nervous deafness, or 1 in $\frac{1}{63}$d part of the cases. In general, nevertheless, in this last disorder, the secretion of cerumen, as well as the mucous secretion of the middle ear, are remarkably diminished. 3*d*, Catarrhal inflammation of the auditory *meatus*, and a certain degree of inflammation of the membrane of the tympanum, yet without this inflammation tending to suppuration, ulceration, or any other destruction of texture.

Among 305 instances of chronic inflammation of the membrane of the *tympanum* with perforation, internal *otitis* evinced its presence in only 6 instances. When inflammation of the membrane of the tympanum was not attended by perforation, the internal ear never presented at the same time an accumulation of mucus in the interior.

In the case of erysipelas of the auricle or *pinna*, the swelling causes obliteration of the entrance of the auditory *meatus*; but beyond this point inflammation does not extend.

Accumulation of *cerumen* in no instance induces disease of the membrane of the *tympanum*, from whatever period its presence may be dated; at the worst, it causes a little congestion, which disappears spontaneously. The reappearance of cerumen ought ever to be considered a good symptom; since it indicates the cessation of chronic inflammation of the membrane of the tympanum.

In phlegmonous inflammation of the auditory tube, the swelling of the walls of the *meatus* may proceed to such extremity, as to prevent the membrane of the tympanum from being seen; but when the abscess is once burst, the membrane is recognised; and then it is seen that it has only lost for some days a little of its transparency.

Inflammation of the mucous membrane of the *tympanum*, with accumulation of mucus, extends neither to the tympanal membrane itself,* nor to the labyrinth; as soon as the mucus is discharged, hearing is restored. M. Kramer has satisfied himself in more than 164 instances of this form of disease, that the tympanal membrane was quite sound.

If we look to the relations which subsist, in a diagnostic point of view, between those diseases of the ear which have already been noticed, we find, that of all these diseases, that order which may be recognised at first glance and by simple examination,—that is, diseases of the *pinna*,—are the least numerous and the least important. All others require, for the purpose of correct diagnosis, special means of exploration. Thus, for diseases of the internal auditory *meatus*, and the membrane of the *tympanum*, it is requisite to employ the *speculum* by the aid of bright sunshine. Without this means, it is quite impossible to obtain the slightest accurate idea on the seat and peculiar character of the diseases of these parts, and consequently impossible to establish any rational and useful mode of treatment. In order to convey an idea of the importance of this mode of examination, it may be stated that the diseases of the external auditory *meatus* and of the membrane of the tympanum, form about one-third (728 cases) of all the diseases of the ear; and that of this large number, the diseases of the membrane of the tympanum form about two-thirds (442 cases). It is, therefore, within and beyond the membrane of the *tympanum*, and consequently beyond the field of direct observation, that two-thirds of the diseases of the ear are seated. In this situation the *speculum auris* can give no information, except that the auditory tube and the membrane of the *tympanum* are in a state of integrity, and that consequently it is requisite to search for the seat of the disease in the middle or in the internal ear. Catheterism of the Eustachian tube, on the other hand, is of great service, whether the examiner confines himself to blowing through the ear-catheter, or causes, by means of the air-syringe, a current of air to pass into it, or introduces a bit of catgut, or a whalebone or ivory probe, in order to ascertain the condition of the Eustachian tube and the tympanal cavity, and to know whether there be any morbid state of the auditory nerve. In this case, the practised tact, and the nice and delicate ear, constitute the superiority of the physician accustomed to this species of exploration. The sense of hearing especially, by enabling the physician to estimate the nature of the sound produced by the air entering the tympanal cavity, is of great service; for though hearing does not furnish indications so positive as ocular inspection, this forms no reason for rejecting its aid whenever it is necessary to inquire into the presence or nature of those diseases, which there may be reason to believe affect the deep-seated parts of the auditory apparatus. From all these considerations, M. Kramer thinks that it is impossible for an enlightened and honest practitioner to treat diseases of the ear, except mere affections of the auricle, without having carefully explored the condition of the internal parts with the *speculum*, and, in cases demanding it, by catheterism and its auxiliaries; in other words, without having fully and perfectly satisfied himself of the nature of the diseases requiring treatment.

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* The membrane lining the tympanal cavity.

M. Kramer has undertaken lengthened and careful researches on the degree of the faculty of hearing in different diseases of the ear. It is easy to understand that, for researches of this nature, it is requisite to have a term of comparison. M. Kramer thinks that the best of all is the old one of the beats of a watch. Persons in whom the hearing is good, hear the beating of a watch, if it be a little loud, at the distance of thirty feet; those who do not hear a watch at all, even when it is placed immediately over the ear, hear what is said to them only when the individual speaking is placed immediately near them, and speaks very loud. Hearing is a little better when the beats of a watch are heard upon direct application; but it is only when patients can hear this beating at the distance of several inches, and particularly of several feet, that they can follow a conversation. A point deserving observation is, that the capacity of the ear to perceive the sound of the human voice is not always in proportion to its capacity for distinguishing the beat of a watch. We see sometimes deaf persons follow a conversation with more facility than might be supposed, from the difficulty they experience in perceiving the beats of a watch. In other instances, as on the contrary, they hear the sounds of a watch a great deal better than those of speech. Considered by itself, the faculty of hearing, measured by the perception of the beats of a watch, is, in general, only of moderate importance. It is a great deal more proper to endeavour to discover the nature of the disease, than to ascertain the degree of accompanying deafness. The degree of the power of hearing, nevertheless, ought to be examined on the two sides comparatively.

Dr Kramer has examined the degree of the power of hearing in 2000 patients,—consequently in the case of 4000 ears; but as in 361 cases the defect affected only one single auditory apparatus, these 361 cases must be deducted from 4000, by which they are reduced to 3639. This examination led to this general result, that in all the diseases of the external auditory *meatus*, of the membrane of the tympanum, of the middle ear, and of the internal ear, there may be a form of deafness carried to a great degree; but that it is chiefly in diseases of the internal ear that deafness is most frequent and most complete.

In two cases of obliteration of the Eustachian tube, the patients did not hear at all the ticking sound of a watch.

In three among four cases of internal *otitis*, the auditory power was also extremely enfeebled, doubtless in consequence of great disorganization of the organ.

Among 1028 patients labouring under nervous deafness, 214 did not hear the ticking sound of the watch, either by one or the other ear. Of these last, one was under ten years; but as he had learned to speak before deafness had been induced, he had retained this faculty; 151 patients heard the beats of the watch only by one ear; this was the left ear in 77 persons, and the right ear in 74 persons. Those cases in which nothing could be expected from treatment were in number 365, that is to say, one-fourth of all the cases of nervous deafness. The half of the persons affected by it were below forty years of age.

Among the whole number of ears examined by M. Kramer, in number 3639, or among the whole number of ears affected by nervous deafness, in number 2012, he counted only 217 or one-ninth, in which the beats of the watch were perceived on immediate application; 339 persons heard the beats at the distance of one inch, and 595 at the distance of one foot. In these two last degrees of nervous deafness, M. Kramer thinks that it may be regarded as an advantageous result of a treatment lasting from three to six months, if the auditory power have been extended from one inch to one foot in the one class of cases, and from one foot to two feet in the other.

Chronic inflammation of the membrane of the *tympanum*, though it produces in general very serious organic changes, is a cause of deafness twice less frequently than nervous deafness. Most usually the boundary of the auditory power is from one to three feet; one foot in half the cases, and three feet in one-sixth of them. It is to be observed, that, with organic alterations in the membrane of the *tympanum*, quite analogous in appearance, deafness may vary within very extensive limits; and conversely, that, with great differences in the state of the membrane of the tympanum, very different degrees of deafness may exist. It is a very frequent sort of contradiction, when there is perforation of the membrane of the tympanum, and which is explained by the impossibility in which the observer is placed, of recognizing and determining the presence of changes, which, independent of perforation of this membrane, are produced in the parts contained within the cavity of the *tympanum*. In all cases in which, when, in chronic inflammation of the membrane, the patient does not hear at all the beats of a watch, or hears them only at a very short distance, there is but little or no hope of re-establishing the power of hearing, even though the physician may put a stop to the inflammatory process. The prognosis is a little more favourable when the auditory power, as determined by the beats of the watch, extends to several inches; yet it is impossible to be very confident of success.

In *periostitis*, with caries of the external auditory meatus, and in contraction of the Eustachian tube, we find very frequently considerable consecutive weakening of the auditory power; and this is always in direct proportion to the extent of the organic alterations. On the other hand, in phlegmonous inflammation of the auditory *meatus*, in acute inflammations of the membrane of the *tympanum*, in catarrhal inflammations of the *meatus*, in accumulation of wax or ceruminous matters, and in obstructions of the middle ear by mucus, it is rare to see well-marked deafness, how considerable soever be the changes undergone by these parts. In this case, deafness, even when it proceeds to a very great degree, is of little importance in forming a prognosis; for these diseases are not only without doubt curable, but the deafness by which they are attended disappears as they subside, however well-marked it may be. The condition of the auditory power, it is important nevertheless to ascertain, as it will make known the progressive advancement towards cure.

M. Kramer gives a statistical table to make known the condition of the auditory power in chronic inflammation of the membrane of the tympanum and tympanal cavity; and he has established the inference, that in this chronic inflammation, when the membrane was perforated, which took place in 217 patients, and in 305 ears, deafness was complete in 50 cases; the auditory power extended to 1 inch in 80 instances, to 1 foot in 113 instances, to 3 feet in 50 instances, to more than 3 feet in 9, and beyond this length in 3 instances. Among 180 patients, or 359 ears, in which inflammation was chronic, but without perforation, deafness was complete in 42 instances; the auditory power extended to 1 inch in 88 instances; to 1 foot in 148, to 3 feet in 51, to more than 3 feet in 19, and was indeterminate in 11 cases.

Complete deafness was proportionately more frequent, (one-fifth of the cases), when perforation of the membrane of the *tympanum* was of very small dimensions. It was less frequent when this perforation was of the diameter of a lentile, which took place in $\frac{1}{6}$ of the cases, and more rare still, when the membrane was not perforated, which happened in $\frac{1}{8}$ of the cases.

A degree of auditory power, one inch in extent, was, as an average term, as frequent with different degrees of perforation as without perforation of the membrane (being as 1 to 4), while an auditory power, one foot in extent, was observed proportionally more commonly among the cases in which the membrane was not perforated, which was in the proportion of $\frac{1}{3}$ to $\frac{1}{2}$.

A degree of auditory power, three feet in extent, was more usual in the case of loss of considerable substance of the membrane of the *tympanum* (in the proportion of 1 to $4\frac{1}{2}$). It was less common in the instances of small perforation, or when the membrane was entire, that is, in the proportion of 1 to 7.

This was still less frequent in perforations which presented the dimensions of a lentile.

A degree of auditory power exceeding three feet coincided in general with integrity of the membrane of the *tympanum;* (this was in the proportion of 1 to 18); and in the instance of perforation of this membrane, this auditory power was observed more frequently when the perforation was of the diameter of a lentile, which was the case in the proportion of 1 to 23.

From the observations of M. Kramer, therefore, it results, that in chronic inflammation of the membrane, hearing is much less frequently involved when this membrane is not perforated than when it has been perforated, and, consequently, that little advantage is derived from the operation of perforating the membrane of the tympanum. If, nevertheless, it be determined, in certain cases, to have recourse to this operation, it would be necessary to make an opening something large; for it appears to be established as a fact, that hearing suffers a great deal less from a large than from a small opening. It would be requisite, further, to bear in mind, that perforations having the diameter of a lentile are four times more frequently the cause of deafness than small openings, so that the advantageous chances of a large perforation are much less considerable. It results, then, from the tabular view given by M. Kramer, that, in no instance of perforation has hearing ever been completely preserved. In 9 instances only, the auditory power exceeded 3 feet, 12 feet in one case, and from 10 to 30 feet in another, but it continued normal in none. With this degree of auditory power, patients easily maintain conversation, provided they give to it due attention, so that a superficial observer might believe that partial destruction of the membrane is compatible with perfection in hearing. This is a positive error. Perforation of the membrane of the tympanum always involves a degree of imperfect hearing more or less considerable.

M. Kramer has completed, to the present time, the history of chronic inflammation of the membrane of the *tympanum*, by carefully studying the condition presented by this membrane in cases of chronic inflammation.

Among 397 instances of this form of aural disease, both ears were affected in 279 instances, and only one ear in 118 instances; in other words, the membrane of the tympanum was the seat of inflammation in 676 instances. In 118 instances only among 397, or in rather less than 1 in 3, this disease existed independently of polypi and perforation; but in the residual 279, or in rather more than ⅔ the membrane was either perforated, (in 217 cases), or covered with polypous vegetation, (in 99 cases); or lastly, it presented the two lesions associated, (in 37 cases). Most of the discharges which proceed from the auditory meatus, that is, about 6/7, depend on chronic inflammation of the membrane of the tympanum with perforation, or with polypous productions. The prognosis and the treatment required for these discharges are consequently into the prognosis belonging to and the treatment required by lesions of the membrane of the *tympanum*.

It is more frequent to see the membrane of the *tympanum* perforated or covered with vegetations on one side than on both sides at the same time, in the proportion of 129 to 88 for the first lesion, and in that of 75 to 24 for the second; and it is principally the right ear which is affected, the proportion being that of 75 to 52 for the right ear, and of 44 to 31 for the left ear. This result perfectly agrees with those furnished by the general statistics of diseases of the ear.

Polypi are rarely coincident with perforation of the membrane of the *tympanum*. The numerical proportion is that of 37 to 397, or 1 to 10½.

Perforations of the membrane of the *tympanum* present great differences as to extent. They resemble a pin-hole in $\frac{1}{6}$ of the cases, more frequently they might contain a pea or a bean. In $\frac{2}{6}$ of the cases, and in this last form, a shred or slip of membrane remains in the shape of a sickle; most commonly they are the size of a lentile (in $\frac{3}{6}$ of the cases).

Among 305 instances of perforation, ringing or tingling of the ears was absent in 188, that is, in more than one half; and the symptom was present in not more than 117. This symptom appeared in proportion more frequently when the perforation was of the diameter of a bean, that is, 3 times in 5 instances; a little less frequently when the perforation was like a pin-hole, viz. in 3 among 7 instances; and still less frequently when the perforation was of the dimensions of a lentile, viz. in 3 among 9 instances.

To the study of this last phenomenon, namely, tingling of the ears, M. Kramer has devoted particular attention, on the one hand, because it is one of the most common symptoms in persons labouring under diseases of the ear; on the other hand, because some authors have attached to it great importance.

Among the 2000 instances of aural disease already mentioned, M. Kramer noted tingling of the ear as a symptom in 1267 cases. He found no trace of it in the deaf and dumb patients.

In the instances of accumulation of ceruminous matters within the auditory meatus, in acute inflammation of the membrane of the tympanum, and in nervous deafness, diseases all essentially different from each other, tingling of the ear was present three times in four; while, in catarrhal inflammation of the auditory *meatus*, in phlegmonous inflammation of the same tube, in internal *otitis*, and in accumulation of mucus within the cavity of the *tympanum*, tingling of the ears was wanting as often as it was present. In chronic inflammation of the membrane of the *tympanum*, tingling was absent twice more frequently than it was present.

Tingling of the ear presents many varieties in relation to the character of the sound which is perceived by patients, its persistence and its intermissions, as well as in relation to the period of the disease at which it first appears, and completely subsides. But all the varieties may attend indiscriminately all the diseases of the ear; and conversely all these diseases may run their course without at any time presenting a trace of tingling, and without its being possible to explain its presence in one case and its absence in another. Finally, when it is present, very rarely is there not at the same time some modification in the auditory power. Tingling of the ear is then one of those phenomena, which, in a view to diagnosis, prognosis, and even to treatment, possess not the smallest importance. If it exist, for instance, in cases of accumulation of ceruminous matters or of mucus, it disappears as soon as the obstacle has been removed, and along with it the deafness. M. Kramer, it is to be observed, has abandoned for this reason the division of nervous deafness which he had established into *with* and *without* tingling of the ear.

Of all the diseases of the ear, *three* only may be considered as having ordinarily an acute progress, viz. erysipelas of the auricle or *pinna*, acute inflammation of the membrane of the *tympanum*, and phlegmonous inflammation of the walls of the auditory *meatus*. All the others are chronic, or show only the tendency to become acute under particular circumstances, for instance, catarrhal inflammation of the external auditory *meatus* ; and the best proof that can be adduced of their chronic character, is, that among the 2000 patients of M. Kramer, 1650 came to consult him when they had been ill for one year and more, and 164 only, or $\frac{1}{12}$, when they had been suffering for less than one month.

Among the 2000 persons who were the subjects of the researches of M. Kramer, 1274 belong to the male sex, and 726 to the female, which establishes the proportion of $1\frac{5}{7}$ as to males to 1 female, for the comparative frequency of the diseases of the ear among the two sexes.

Of diseases of the auricle or *pinna*, two only were observed in men, erysipelas and abscess ; the three eczematous affections were in females.

Among 281 patients attacked by affections of the external auditory *meatus*, 207 belong to the male sex, and 74 to the female. Among those diseases are enumerated 161 instances of accumulation of ceruminous matters in the male, and 52 instances in the female, which constitutes the proportion of 3 to 1 ; 24 examples of inflammation of the tegument of the auditory meatus in the male, and 17 in the female, namely, the proportion of 2 to 1 ; 6 instances of phlegmonous inflammation of the same canal in the male, and 3 in the female, the proportion of 2 to 1 ; and lastly, 6 instances of *periostitis*, with cases in the male, and 2 in the female, giving the proportion of 3 to 1.

The 442 instances of disease of the membrane of the *tympanum* observed have been 311 in the male and 131 in the female, giving the proportion of $2\frac{1}{3}$ to 1. Of 45 instances of acute inflammation of this membrane, 33 were seen in the male and 12 in the female, giving the proportion of 3 to 1. Lastly, of 397 instances of chronic inflammation of this membrane, 278 were observed in males and 119 in females, giving the proportion of $2\frac{1}{3}$ to 1, or 7 to 3.

Among the 198 persons attacked by diseases of the middle ear, 141 instances took place in males and 157 in females. Among 164 examples of accumulation of mucus within the middle ear, 171 were observed in men and 47 in females, giving the proportion of $2\frac{1}{2}$ to 1, or 5 to 2.

Among 28 instances of contraction of the Eustachian tube, 20 instances are enumerated in males and 8 in females, forming the proportion of 2½ to 1, or 5 to 2. Of 2 instances of obliteration of the same tube, 1 was observed in a man, the other in a female. Lastly, of 4 instances of internal *otitis*, 3 were seen in males and 1 in a female.

Among 1028 instances of nervous deafness, 581 took place in males and 447 in females, giving the proportion of 1⅓ to 1, or 4 to 3; and among 44 persons deaf and dumb, 32 were of the male sex and 14 of the female, furnishing the proportion of 16 to 7, or rather more than 2 to 1.

As to the ages of the patients, these 2000 examples of diseases of the ear were distributed in the following manner: 504, or one-fourth, were from 1 year to 10 years of age, and of the 504, 241, or nearly one-half, were instances of chronic inflammation of the membrane of the *tympanum;* and further, of the 397 examples of the last form of inflammation observed by M. Kramer, two-thirds commenced within the first decennial period, a small amount fewer between 10 and 20 years, a sensible increase in the number between 20 and 30 years, and subsequent to that age, a diminution so rapid and so considerable, that between the ages of 60 and 70 scarcely one single disease of the ear in its commencement is found. As to each of these diseases in particular, they appear at different periods of life in the following manner and proportions.

Accumulation of ceruminous matters within the auditory canal from 20 to 40 years, less frequently below 10 years and after 60 years of age.

Catarrhal inflammation of the external auditory *meatus*, before 40 years, and very rarely after this age.

Phlegmonous inflammation of the auditory *meatus* towards the age of 20 years.

Caries of the auditory meatus within the first period of 10 years. This disorder is in general associated with the strumous diathesis.

Acute inflammation of the membrane of the tympanal cavity, between 20 and 40 years of age. This disease is independent of diathesis.

Chronic inflammation of the membrane of the tympanal cavity, always associated with the strumous diathesis, takes place in two-thirds of the cases, between the ages of 1 and 10 years, and principally in the two first years of life, in consequence of exanthematous disorders. It is usually chronic from the commencement.

[The statement now made does not accord exactly with what is observed in this country, as to the prevalence of these two forms of aural disease. Acute inflammation of the membrane of the tympanal cavity may be in certain instances independent of diathesis; that is, we understand, strumous diathesis. But in a considerable proportion of cases, it takes place in persons manifestly of the strumous constitution, if a judgment can be formed form the other disorders under which they usually labour, and from the disorders which take place in members of the same family. Observation also has led us to the inference, that acute inflammation of the membrane of the tympanal cavity is a frequent concomitant or effect of various acute exanthematous and febrile disorders. Thus, in this country, inflammation of the lining membrane of the tympanal cavity is a result not unfrequent of scarlet-fever, measles, small-pox, and continued fever, *i. e.* synochus or mild typhus, nearly in the order now specified; and in all these instances, it appears as an acute inflammation; that is, it runs its course in from 7 to 10 days, it causes much pain in the ear and head, with first morbid sensibility to sounds, and then deafness.

It is also an idiopathic disorder; that is, it may take place independently, and without any connection with these diseases. Thus we have seen it arise in this manner in consequence of exposure to cold, and cause much headach, fever, sleeplessness, intolerance of sound, and general suffering, so as to require to be treated by means of general and local blood-letting, and all other parts of the antiphlogistic regimen. It must be added, that all the instances which we have seen of this disease have occurred in persons presenting marks of the strumous diathesis more or less distinctly expressed by appearance, habit, and collateral diseases of the patients, and the disorders taking place in other members of their families.

The occurrence of this disorder as a concomitant or sequel of scarlet fever, is manifestly to be ascribed to the very general affection of the mucous membranes which the poison of that disease produces, and to the special tendency which it evinces upon those of the throat.

Further, it is right to say, before concluding this commentary, that we think it difficult, if not impracticable, in all cases, to distinguish between inflammation of the lining membrane of the tympanal cavity and that of the membrane of the *tympanum*. In the majority of instances in this country, probably, there is a considerable affection of the whole lining membrane of the tympanal cavity; and if this proceeds to suppuration, it is liable to cause perforation of the membrane, or rather the membrane of the tympanum is more or less perforated by ulceration in order to allow the escape of the matter. In certain cases, this perforation, after the escape of the matter, is healed and the membrane is restored to its integrity. These may be regarded as favourable cases, less under the dominion of the strumous diathesis. In others, however, it either does not heal up so readily, or the membrane is entirely destroyed, and the tympanal cavity is laid open. These are very unfavourable cases; since, upon every sort of exposure, and from the application of very slight causes, the inflammation, then chronic, is liable to be rendered acute, and to spread to the mastoid cells, causing caries wherever it extends or to the petrous portion of the temporal bone, and to the brain, causing death.

Another disorder, however, which ought to be distinguished from this inflammation of the tympanal cavity and membrane, is inflammation of the internal extremity of the auditory meatus and the outer surface of the membrane of the tympanum. This disorder always gives rise to a serous or sero-purulent or purulent exudation, lasting for several days, and in some instances for a longer time. It may arise either idiopathically, or as an effect of scarlet fever, of measles, of small-pox, or synochus, or of typhus; and may continue for sometime, eventually subsiding. In other instances, it appears to extend through the membrane right into the tympanal cavity, and then it is identified with inflammation of the lining membrane of that cavity.

These observations we have thought to be necessary in order to explain certain of the points relative to the history of these diseases, and their pathological relations.]

Accumulation of mucus within the cavity of the tympanum takes place from 1 to 10 years principally, (or two-fifths of the cases); it is more rare between the ages of 10 and 20 years (one-fifth); still less frequent after the age of 20 years. It is always accompanied with a considerable degree of deafness; and, as ordinarily two ears are simultaneously affected, the deafness which it causes is most unpleasant to patients. Gradually, however, one of the ears gets cleared of its unnatural contents, ($\frac{1}{8}$ of the cases), while the other remains more or less obstructed.

Inflammation of the mucous membrane of the Eustachian tube with contraction, affects most commonly only one side; ($\frac{1}{2}$ of the cases); and its progress is less rapid than that of accumulation of mucus. Of the period of life at which this lesion usually takes place, no precise information has been obtained.

Nervous deafness in at least $\frac{1}{8}$ of the instances comes on very slowly, so that it is not always easy to trace it accurately to its origin. Most generally it is developed between the ages of 20 and 30 years, in consequence of exposure to cold, or the influence of mental emotion and disquietude. Before 10 years and after 60 years, it is very rare, taking only 1 in 171 cases. It affects at first one ear, and makes very slow progress, and affects the ear of the opposite side only after a very long period. Among 214 persons who did not at all hear the ticking sound of the watch, either with one ear or the other, 109, or more than one half, were under 40 years of age, and enjoyed for the most part very good health. It was the same with 71 persons among 151, who had lost the hearing of one side. Persons above 40 years of age who presented this form of deafness, had been labouring under it, in general, for a long time, and belonged, of course, to the preceding category.

[It may be proper to mention that the peculiar form of deafness called *Nervous*, depends, in this country, occasionally, if not often, on disorders of the alimentary canal, and the intemperate use of spirituous and vinous liquors, and of malt liquors. It is difficult to determine whether the pathological state of the parts concerned in nervous deafness be always the same, and whether exactly the same parts be always affected. Nervous deafness may be seated either in the labyrinth or internal ear, or in the acoustic nerves before they enter the labyrinth. What is the state of the labyrinth, on which depends nervous deafness, it is not always easy to determine. The whole labyrinth is lined by a peculiar fine membrane, and it is possible that certain changes in this membrane may be one source of nervous deafness. All the cavities and compartments constituting the labyrinth,—namely, the vestibule, the semicircular canals, and the interior of the cochlea,—contain a pellucid watery liquid; and this fluid may be liable to changes, causing different degrees of nervous deafness. Separate compartments of the labyrinth even may be affected. Thus, the vestibule may be affected either in its lining membrane or in its contained liquid, without the semicircular canals and cochlea; the semicircular canals may be affected, while the vestibule and cochlea remain in a state of integrity; or the cochlea may be in an unnatural state, while the vestibule and semicircular canals may remain sound. Again, the nervous extremities distributed in the cochlea, and lying in this fluid, may be diseased. These facts are mentioned to show the complexity of the apparatus concerned in this species of deafness; and to explain how difficult it is, to specify the exact morbid state in which nervous deafness depends.

It has been above said that nervous deafness seems to depend, in certain instances, on disorder in the alimentary function, and in the intemperate use of vinous or spirituous liquors. The existence of this form of nervous deafness is to be determined partly by negative symptoms, or analysis of the symptoms upon the method of exclusion, partly by studying the state of the alimentary function, and partly by observing the effects of the *juvantia* and the *lædentia.* Thus, if upon careful exploration of the *meatus externus*, it appear that there is no state either of the meatus or the membrane of the tympanum to account for the deafness, then the question comes to be, is the cause of the defect of hearing within the tympanal cavity, or in the Eustachian tube? Catheterism of the tube, examination of the throat, and the use of the air-syringe through the tube, are next to be attempted; and if they furnish no positive information, it may still be doubtful whether the membrane of the tympanal cavity be in a healthy condition. Time, that is, the course of the complaint, is in many instances the only certain means of furnishing information on this point.

Regarding the state of the alimentary function, if the bowels be habitually constipated, the abdomen rather large and full, indicating obstruction and slow circulation,—if there be variable appetite, morning thirst, flatulence, acidity, and turbid urine,—it will generally be found that digestion is imperfect and inadequate, not performed regularly and efficiently, and that the mucous membrane of the alimentary canal and its circulation are irritated and disturbed by the presence of imperfectly-digested food. This condition affects the extremities of the splanchnic nerves, which again reflect their irritation to the centres of the nervous system, the spinal chord, and brain. In the latter organ, they cause various disorders in circulation which need not here be mentioned. But besides the brain, the internal ear is liable to have a part of this reflected action thrown upon it; and the result is nervous deafness. At all events, the fact is certain, whether this be the correct explanation or not, that in conditions of the alimentary function, such as that already referred to, nervous deafness takes place.

If, however, any doubt were entertained of this mode of this formation of nervous deafness, it must be either greatly diminished or altogether removed by the effects of treatment. We have seen various instances of deafness, without discharge from the ear, or any proof of obstruction either of the *meatus externus*, or of the tympanal cavity, or of the Eustachian tube, in which the infirmity disappeared under the use of remedies and treatment by which the function of digestion was regulated, rendered more active and improved. In other instances, in which the deafness has not altogether disappeared, it has been very much diminished by the same method of management.

Lastly, we have seen several instances of deafness coming on, first in one ear and then in the other, in persons who drank largely wine or spirituous liquors. In a few of these, in which the habit was from various circumstances given up, and the individuals lived temperately, deafness disappeared, and hearing was restored. In one remarkable case which came under observation, the individual began to become deaf between 35 and 40 years of age; and so deaf did he at length become, that he was quite unable to hear conversation in the ordinary business of life, and had thereby been rendered completely unfit for transacting any sort of business. During all this time he had been in circumstances in which he drank spirits pure or diluted several times daily, and often in the evening. During this space of time, also extending to between 30 months and 3 years, the sleep was disturbed by cries and frightful dreams; and so frequently had the patient spectral illusions, that he could not sleep during the night without a light burning constantly in the apartment. During all this period the individual was led to have recourse to the use of spirits during the day, in order to remove the uncomfortable and dispiriting effects of the manner, in which the nights were spent. By the use of these means the days went over tolerably well, except for deafness, and the inability to transact business in consequence. The nights, on the other hand, were restless, disturbed, and miserable. When awake, the idea of frightful figures in the room never ceased to haunt him. He had no sooner fallen asleep than feelings of nightmare, frightful dreams, and alarming visions beset his fancy.

To diminish and remove this deafness all the usual approved remedies had been tried, and all to no purpose. Particular circumstances, however, took place, which partly compelled him to give up the frequent potations, partly withdrew him from the company in which the habit had been strengthened, if not acquired. Instead of taking several glasses of spirits daily, days elapsed in which he could get none, and after a time weeks elapsed when he had nothing more stimulant than tea, coffee, or a glass of porter or beer. For some time little change was observed, except that the health was better, the appetite was good and regular, and sleep was quite undisturbed. At length, after the lapse of some months, the deafness began to diminish, at first almost imperceptibly, then more distinctly, and in a few months more it had become so trifling, that it was observed only at times. It was indeed become intermittent. At length, after the lapse of about two years, during which the individual was much occupied, taking exercise in the open air, and following active and regular duties, the deafness had entirely disappeared, and the person heard as well as ever in his life. The spectral visions ceased to appear, and disturbed sleep to be suffered; and the individual had no return either of spectral illusions, disturbed nights, or deafness in the whole subsequent course of life, which was prolonged to 70 years.

It seems impossible to regard this as an example of any other disorder but nervous deafness. Had it depended on any considerable change in the parts of the organ of hearing, or any organic alteration, the patient could not have recovered so perfectly as he did.

A species of deafness we have observed to arise in certain persons from sudden exposure to cold,—for instance, bathing in the sea, and from similar circumstances. The affection is always obstinate, very often incurable. As no morbid state of the *meatus* is visible, except perhaps unusual dryness, there is strong reason to believe that the seat of this infirmity is either in the labyrinth and its nervous contents, or in the acoustic nerves as they issue from the brain. In instances of this sort of deafness it is common for the individual after some time to have an attack of palsy or a slight apoplectic seizure, followed by palsy. In general the infirmity remains through life, resisting the effects of all remedies and treatment; and eventually palsy or apoplexy terminates the existence of the patient. This appears to be a form of nervous deafness, but to constitute part of the general disorder of the brain and its blood-vessels. The arteries of the brain in cases of this nature are almost constantly found rigid, firm, steatomatous, or osteo-steatomatous in specks and patches; and sometimes blood is effused; or spots of the middle lobe and base of the brain present those orange-coloured degenerations which are known to be the effects of previous capillary congestion or slight bloody exudation.

Can it be said with any probability, that certain cases of nervous deafness depend on some morbid condition of the *ossicula* of the tympanum and their muscles? It is observed that very loud noises are occasionally the cause of nervous deafness; for instance, the long-continued firing of artillery; and it seems possible that such sounds, so loud, may act not only on the internal ear or labyrinth, but also on the *membrana tympani* and the chain of small bones within the *tympanum*.

As to other causes of this infirmity, the reader is referred to the observations in pages 303 and 304.]

M. Kramer has further studied the influence of social position, of the mode of life, and of the state of health or disease, on the production of diseases of the ear. The three first causes appear not to exercise great influence, or at least the researches of the author lead to no prominent result. As to the influence of the state of health or of disease on the production of acoustic infirmities, more than $\frac{4}{5}$ of the persons labouring under diseases of the ear were and had been in good health; so that the disease may be considered as purely local. For this, local treatment only was employed, and no circumstance indicated the necessity of general treatment. In the last fifth were observed complications, of which the most frequent was general nervous debility, which coincided almost exclusively with nervous deafness, and in all cases with inflammation of the mucous membrane of the middle ear.

Inflammation of the tympanal mucous membrane is very often connected with struma (26 instances of this combination were observed among 164 of accumulation of mucus within the middle ear, equivalent to $\frac{1}{6}$); and with catarrh; (18 instances of this combination, equivalent to $\frac{1}{9}$). Catarrh may also exist along with nervous deafness; but the combination is rare.

In inflammation of the glands of the external auditory meatus, (the ceruminous glands), about $\frac{1}{8}$ of the instances depend on the strumous diathesis. The proportion for chronic inflammation of the membrane of the *tympanum* is the same.

Gout and rheumatism are seldom observed in the course of disorders of the ear. Catarrh is frequent in instances of accumulation of mucus within the middle ear, and especially in instances of contraction of the Eustachian tube. In nervous deafness it is rare.

Fits of giddiness were observed in one instance of accumulation of ceruminous matters, in three instances of polypous growths from the membrane of the *tympanum*, and in seven instances of nervous deafness; the patients laboured under hemorrhoids in seven instances of nervous deafness; and under pulmonary consumption in one case of caries of the middle ear, and in four instances of nervous deafness. In acute inflammatory attacks, M. Kramer has always observed a degree of inflammatory fever more or less intense.

Nothing is in general more difficult than to determine the causes of diseases of the ear. On the one hand, the incipient stage of these diseases often passes over unobserved, because pain is seldom felt; on the other hand, deafness, a discharge from the ear-hole, and tingling of the ear, often alone engross all the attention of patients, though the disorder may have commenced a long time previously. Patients also often assign, as causes of these disorders, the influences to which they have been accidentally exposed, at the time at which have appeared the symptoms, which have exclusively attracted their attention.

In 1109, that is, more than one-half of the 2000 cases above referred to, the cause of the disorder was completely unknown. Exposure to cold appears to have been the most common cause of acute inflammation of the membrane of the *tympanum*, namely, in $\frac{2}{3}$ of the instances, and of phlegmonous inflammation of the external auditory meatus, the number of instances being one-half. Exposure to cold is further a sufficiently frequent cause of that form of inflammation which induces accumulation of mucus within the middle ear, namely, in $\frac{1}{3}$ of the cases; of the erythematous inflammation, which causes accumulation of ceruminous matters within the auditory tube; (in $\frac{1}{3}$ of the cases;) and of inflammation of the glands of this last-mentioned tube, in $\frac{1}{3}$ of the cases. Nervous deafness and chronic inflammation of the membrane of the *tympanum* have still more frequently as their cause the operation of cold; this being the case in from $\frac{1}{10}$ to $\frac{1}{14}$ of the whole instances.

The *exanthemata* and other diseases of the skin frequently cause chronic inflammation of the membrane of the *tympanum*; and among these exanthematous disorders, the first rank must be assigned to scarlet fever, which itself had produced one-fourth of all the examples of this sort of inflammation. This last eruptive fever appears to have smaller influence in the induction of nervous deafness. The proportion is $\frac{1}{68}$ of the instances.

Nervous fever and gastric fever may, though not frequently, induce chronic inflammation of the membrane of the tympanum and nervous deafness. Gastric fever was in two instances the cause of an accumulation of mucus within the middle ear. A circumstance useful to be borne in mind is, that these last affections were well marked and very obstinate.

Blows upon the ear were in three instances followed by inflammation of the glands of the auditory *meatus*; in twelve instances, by chronic inflammation of the membrane of the *tympanum*; and in twenty-four instances, by nervous deafness. This deafness may in some instances ensue in an instantaneous manner, and assume a high degree of intensity, in consequence of any physical lesion of the head and spine.

Deaf-dumbness is frequently to be traced in children to disease of the brain with convulsions; this took place in $\frac{1}{3}$ of the cases.

Nervous deafness is in some instances the consequence of a violent moral aversion, or affliction, of a severe fit of toothach, of a profuse hemorrhagy, or the concussion caused by very loud noises.

This same form of deafness appears to take place, under the operation of hereditary influence, in the proportion of 1 to 6. The hereditary disposition to the accumulation of mucus within the middle ear, and to chronic inflammation of the membrane of the *tympanum*, is comparatively less frequent; the first five times, the second nine times so.

M. Kramer devotes a special statistical tabular view to the investigation of the circumstances, which may be followed by perforation of the membrane of the tympanum; and he arrives at this result,—that chronic inflammation of the membrane of the *tympanum* leads more frequently to perforation when it is caused by exposure to cold or the poison of small-pox, than when it takes place under the influence of scarlet fever and of measles; the proportion for the instances of the former being $\frac{4}{5}$ of the cases, and that for those of the latter $\frac{1}{2}$. In other words, it is the inverse of what has been stated above upon double perforation of this membrane. This last form of perforation takes place most frequently after measles, that is, 14 times in 15 instances; a little less frequently after scarlet fever, 32 in 49 cases, or $\frac{2}{3}$; less frequently after small-pox, 3 in 9 instances, or $\frac{1}{3}$; and still less frequently after exposure to cold, the instances being 6 in 22, or $\frac{3}{11}$, or a little more than $\frac{2}{7}$.

In reference to the extent of this perforation as a consequence of inflammation, the aperture was proportionally larger after small-pox, as in 5 among 12 instances, it was of the dimensions of a pea; less frequently was it of this size after measles, the numbers being 8 times in 29 instances; after scarlet fever, in which it was of this size, 20 times in 81 instances, or $\frac{1}{4}$; and exposure to cold, being 7 times in 28 cases, also $\frac{1}{4}$. From these facts, the inference is, that small-pox is the disease which most frequently and most extensively destroys the membrane of the *tympanum*, at least on one side, while measles most frequently induces perforation of this membrane in both ears, and scarlet fever and cold exert an influence less pernicious, though still sufficiently virulent.

Diseases of the ear present very great differences in what relates to treatment. In the first place, in order to be satisfied that the disease which is to be submitted to treatment has got well, or has been relieved under the operation of the therapeutic measures adopted, it is requisite to have recourse to different processes. As to the auricle, direct inspection is sufficient; for the auditory *meatus* and the membrane of the *tympanum*, it is requisite in addition to have recourse to the employment of the *speculum auris;* for diseases of the tympanal cavity and the Eustachian tube, it is necessary to employ catheterism and the air-injection; lastly, for the internal ear, it is only by measuring accurately the degree and extent of the auditory power, that it is possible to determine the amount of improvement which has been effected.

M. Kramer undertakes to answer an objection often brought against physicians, who devote themselves to the treatment of diseases of the ear. Without disputing the amelioratión of the complaint, or the cure which they may effect, it has been repeatedly observed, that these instances of amendment or cure are seldom of long duration. To this M. Kramer replies, that if, to establish the fact of an amendment or cure, it were necessary to wait for months and years, in no disease could it be said that there was ground for treatment; still less for those of the ear, which, not less than other diseases, are liable to relapses. It must be confessed, nevertheless, that to patients it is an interesting fact to know, that their disease is amended or cured even for a long time; and, without this hope, it would be impossible to understand why they should wish to subject themselves to the trouble and the expenses which a lengthened course of treatment in all instances involves.

As to sanability, M. Kramer divides diseases of the ear into four orders; *1st*, diseases certainly curable; *2d*, diseases of which the cure is only probable; *3d*, diseases susceptible of amendment only; and, *4thly*, incurable diseases.

1. Among diseases *certainly admitting of cure*, whatever be their duration, their degree, and the negligence of the patient in applying for assistance, M. Kramer classes erysipelas of the auricle or external ear, and boils of the same part; accumulation of ceruminous matter within the auditory *meatus*, catarrh of the same tube, and phlegmonous inflammation in it; acute inflammation of the membrane of the *tympanum*, and catarrh with accumulation of mucus within the middle ear.

Erysipelas and boils of the external ear require no particular mention. It is different with accumulation of ceruminous matters, and of epidermal scales within the auditory *meatus*. Cutaneous rose of this passage, which causes this accumulation, does not fail to disappear, and leaves after it the ceruminous matters and the epidermal layers. Further, when the auditory passage has been cleared of these foreign matters, the patient is immediately and completely cured of deafness, of tingling in the ears, of the confusion which he felt within the head, and in general of all the symptoms under which he was suffering. If the investing integument of the auditory *meatus*, and the membrane of the *tympanum* were reddened, this redness disappears spontaneously. M. Kramer quotes 213 instances in which the cure was thus immediate, though the disease had lasted in some of these patients for several years. The practitioner is, nevertheless, not in all cases equally fortunate. In some instances, 16 among 2000 cases, along with accumulation of ceruminous matters, was associated nervous deafness. It is then to be understood that the extraction of the foreign matters is followed by some relief, but only so far as the symptoms depend on their presence. When the plug of foreign matters is withdrawn, these cases are to be classed, as to their degree of curability, in the second order established by M. Kramer.

Catarrh or inflammation of the skin and glands of the external auditory *meatus* always yields to the use of injections of acetate of lead, revellents, and purgatives; in recent cases of the disorder the cure is very rapid. The case is not altogether the same when the patients possess a disposition to impetiginous and strumous disorders. To the local treatment in such circumstances it becomes requisite to associate a system of appropriate general treatment; and the cure may require months for its completion. Among 51 instances of this sort of complaint, 49 finally were cured; the other two patients gave up the treatment before a cure was obtained.

Phlegmonous inflammation of the auditory passage speedily proceeds to suppuration, if inflammation have not been arrested by the application of leeches. Nevertheless, when the abscess has been opened, all the symptoms rapidly disappear. The swelling of the auditory canal may, in this tribe of cases, cause for some time afterwards disorder in the faculty of hearing; but, so soon as the swelling subsides, hearing recovers its full power.

Acute inflammation of the membrane of the *tympanum* in general yields, in the course of some days, to the application of leeches, the use of revellents, and injections of acetate of lead. M. Kramer thinks it proper to order the application of leeches several times in severe cases; nevertheless, only one patient among 45 took longer than eight days to get rid of the disease.

Inflammation of the mucous membrane of the middle ear, with accumulation of mucus within its cavity, terminates in complete cure by the aid of those means which are calculated to expel mucus and to restore the secretion to its normal condition; and particularly by the aid of catheterism and the air injection. In recent cases, it is even sufficient to blow through the catheter. When, on the other hand, the accumulation of mucus has lasted long, or this same mucus possesses remarkable viscidity, relief is sometimes only afforded by the means above enumerated. In cases of this tribe, M. Kramer employs the air douche, or forcible injection of air; and he observes that cold air imparts tone to the diseased membrane. In this disorder, as in the previous one, this physician often associates with the local treatment, general measures, and appropriate regimen, whenever the patients present indications of any peculiar diathesis, and particularly of the strumous diathesis.

2. *Diseases of which the cure is probable.*—These diseases, among which M. Kramer classes *eczema* of the external ear, *periostitis*, with caries of the osseous parts of the external auditory canal, chronic inflammation of the membrane of the *tympanum*, contraction of the Eustachian tube, nervous deafness,—are so much more easily curable in proportion to the degree in which they are not far advanced, and as they are of recent date. *Eczema* of the auricle, and caries of the bony parts of the auditory canal, are affections on which it is unnecessary to dwell; for the obstinate character which they present has nothing peculiar in the seat which they occupy.

[The truth is, that, while we have from M. Kramer no specific information on the degree of sanability of *periostitis* with caries of the bony parts of the auditory canal, it may be added, that it is a disease which in this country remains in most cases uncured through life. And here, perhaps, it may be necessary to observe that, though this lesion appears by M. Kramer to be considered as unconnected with perforation or destruction of the membrane of the *tympanum* and exposure of the tympanal cavity, yet in patients in this country it is almost uniformly associated with this last lesion. In other words, the denudation of the bony parts and their carious condition, extends within the site of the membrane of the tympanum, and affects the bony part of the tympanal cavity, and then it belongs to or is associated with internal *otitis*. In general, this is easily ascertained by inspection. The discharge is purulent, often offensive in smell, especially when the bowels are confined and digestion is disturbed and imperfectly performed. Sometimes the discharge becomes tinged with blood. This form of the disease is rarely, almost never cured; and the worst part of the disorder is, that the patient is liable to attacks of acute inflammation, which may extend to the internal ear and brain. In general, palliation is all that the case admits of.

In some cases, however, the periostitic affection and the denudation of the bone may be seated external to the membrane of the tympanum; and certainly this form of the disease gives rise to greater hopes of recovery and of cure than the former. The hope, nevertheless, is even in this case rather slender and uncertain; for, from very slight causes, the affection of the bone may extend within the membrane of the *tympanum;* and the case then is like that last noticed—very uncertain of cure indeed.]

Chronic inflammation of the membrane of the tympanum is often associated with a general dyscrasic condition; and the chances of amendment or of cure which it presents, are in proportion to the action which it is possible to exert on the constitution. The extent of the organic alteration of the membrane performs also a considerable part in the degree of sanability. When the membrane is itself considerably thickened or perforated to a large extent, it is impossible to expect to restore its normal structure. Polypous vegetations, which for the most part may be traced to chronic inflammation of the membrane of the *tympanum*, may in general be removed by excision, excepting when they are broad, flattened, and sessile; but as the membrane of the *tympanum*, which presents these vegetations, is at the same time the seat of other changes, and particularly of thickening or of perforation, this excision may be followed by very trifling effects. "If it be remembered," adds M. Kramer, "that in one half of the cases of chronic inflammation of the membrane of the *tympannm*, this membrane is perforated, and that in $\frac{1}{4}$th of these cases there are polypous excrescences, the practitioner may regard as actual success, the results which I have obtained in curing $\frac{1}{14}$th part of these cases, and in amending in different degrees $\frac{11}{14}$ths of them, that is, by moderating suppuration, and by rendering the faculty of hearing more easy, The residual $\frac{2}{14}$ths have undergone no amelioration."

Contraction of the Eustachian tube presents still fewer chances of cure than inflammation of the membrane of the *tympanum*; in these two last mentioned disorders the want of success depends principally on the continuance of organic changes in the affected parts. The same causes prove an impediment to the cure of nervous deafness, whenever the vitality of the auditory nerves has suffered severely. In truth, these nerves present not only a diminution in the susceptibility to certain sonorous sensations, but also a morbid susceptibility to impressions of every sort, which increases with the progress of this disorder. Hence proceeds the difficulty, and in certain circumstances the impossibility, of finding appropriate means capable of acting upon the auditory nerves without exciting them to an excessive degree. Among the number of patients labouring under nervous deafness, $\frac{3}{5}$ths were above 30 years of age; in the half of this number the disease was at least of ten years' duration; in $\frac{2}{5}$ths of these cases the deafness had already attained its most advanced degree. From this circumstance M. Kramer attempted no treatment, or, to speak more to the fact, after having tried treatment, he gave it up in $\frac{5}{20}$ths of the cases, or $\frac{1}{4}$th, in 271 patients who could endure no application, although they appeared in sufficiently favourable circumstances as to period of life and the degree of deafness. On the other hand, he succeeded either in rendering hearing more easy, or in diminishing or suspending the tingling of the ears, in $\frac{14}{20}$ths of these cases, that is, nearly $\frac{2}{3}$ds; namely, among 703;—but in different degrees according to age, and the duration and degree of the infirmity, and the length of the treatment. In $\frac{1}{20}$th of the cases, namely, in 54 only, the cure was complete; but the patients were placed in the most favourable circumstances. In the treatment of this disease M. Kramer always had recourse to the use of stimulating vapours; but for the vapours of acetic ether, which he formerly was in the habit of employing, he has lately substituted vapours of distilled water, of assafœtida, of musk, of bitter almonds, and similar articles. He has rarely had occasion to employ general treatment; and he has observed that nervous deafness does not in all cases undergo a favourable modification under the employment of general measures; these measures, however, may, in some cases, before the adoption of local treatment, be useful in re-establishing the general health, if it be impaired.

3. Among *diseases susceptible only of amelioration*, the author ranks internal *otitis*, a disease in which resolution may in some instances, though not very often, be accomplished, and which most frequently brings along with it, independently of the destruction of the organ, serious dangers to life.

4. *Incurable diseases* comprehend only obliteration of the Eustachian tube, and deaf-dumbness.

It would be wrong to conclude the treatment of disorders of the ear, without adverting to the application which M. Kramer makes of electro-magnetism, in the treatment of nervous deafness and tingling of the ear. This practitioner has ascertained, that an electro-magnetic current is a powerful stimulant of the organ of hearing, principally when this current is directed from the lower orifice of the Eustachian tube, towards the external auditory canal of the same side. This stimulant action is indicated by convulsive movements and pains in the ear, by a temporary increase in the auditory power, which is ordinarily not of long duration, and by increase in the tingling in the ear, either at the time or some time after application. It is a remedy which cannot be employed, except with great prudence and caution, and which must be instantly abandoned, if the tingling is remarkably increased, without any favourable modification in the auditory power, or at least without continuance of this favourable modification. It is further a method of sufficient certainty for ascertaining the existence of nervous deafness.

ART. IV.—*Cholera among the Pauper Children of Tooting.*

THE question of the contagious origin and propagation of cholera is not yet everywhere decided. Several persons in this part of the United Kingdom, looking to the attacks among nurses and others in contact with the patients, have either had their ideas on this subject strengthened, or, from being neutral and undecided, have adopted the inference that the disease is contagious in its origin and mode of propagation.

Many strong facts and arguments might be adduced to show that, if we adhere to fact, this idea is untenable; and that the inference that cholera is contagious, cannot be reconciled with the facts observed. On the other hand, many facts concur to show that the disease owes its origin, in some instances, to atmospheric causes operating probably upon, and aided by, local peculiarities and the physical circumstances of particular districts. Other facts show that its development is favoured by modes of living, articles of food, and similar circumstances.

Without entering into a formal consideration of the circumstances now referred to, and their modes of operation, it may be proper to advert to one or two facts, which contradict rather strongly the idea of contagion either as to the origin or the propagation of the disorder.

One of the most decisive facts against the contagious character and origin of cholera, and which has been overlooked by all,—both partizans and opponents of the contagious hypothesis,—is the fact to which we directed attention in volume seventieth, in the account of the treatise of Dr Prout. That physician, we showed, found, that during the prevalence of cholera in 1832, all the common lateritious sediments disappeared from the urine, and that every individual whose urine was examined, presented those appearances, which are characteristic of the presence of oxalic acid. In short, the oxalic acid diathesis was then prevalent in London and its vicinity. This state of the secretions was connected, Dr Prout further ascertained, with a positive increase in the weight of the atmospheric air, similar to what might be produced by the diffusion of a heavy gaseous principle through the lower regions of the atmosphere. Dr Prout, therefore, drew the conclusion, that the cause of the disappearance of the common lateritious sediment, and the presence of the oxalic acid in the urinary secretion, as well as of cholera, was a poisonous body analogous to malaria, whose high specific gravity and feeble diffusive powers kept it near the surface of the earth, along which it insensibly crept, particularly in low damp situations.

In additional confirmation of the great change which had taken place in the fluids and secretions of the human body during the presence of the cholera constitution, and the existence of the oxalic state of the urine, Dr Prout states that he likewise observed in almost every individual, an unusually acid state of the saliva and of the cutaneous exhalations, such as he had never before witnessed, except in the last stages of chronic diseases, and in malarial disorders. During the same period, and for some time afterwards, also, a greater number of cases of oxalate of lime, renal calculi, and formidable hemorrhage from the kidneys, than he had previously seen during a long course of observation, or since that time.

Now, it is of comparatively little moment whether the above-mentioned explanation of the existence in the atmosphere of a dense, heavy, poisonous agent be correct or not. The fact is uncontroverted, and cannot be controverted, that a great and striking change in the fluids and secretions of the human body then took place. This is not the manner of a contagious disease, but that of a great, general, and extensively-operating agent. A contagious disorder is one which is spread from one person to another by some poisonous principle elaborated in the system of the former, and communicated to that of the latter. In this instance, hundreds, and probably many thousands of persons were affected simultaneously in the same manner. The affecting agent, therefore, must have been one of universal or general influence, and which at once affected many thousands in the same manner.

We have always maintained that the mode in which diseases, and especially cholera, appears and disappears in different places, is the great test of the contagious or non-contagious character of such diseases. If any disorder appears suddenly, and at once affects great numbers; or if, though it appear more slowly, it affects, within a short space of time, great numbers, and who have no communication with each other, then the probability is, as near to demonstration as can be obtained, in subjects of this nature, that the disease is not contagious, but atmospheric, telluric, miasmatic, or in some manner dependent for its origin on general causes. No one, except old ladies, now considers influenza to be contagious; yet, between seventy and eighty years ago, and even later, that disease was universally called contagious catarrh, and considered contagious by physicians. No one considers ague or remittent fever contagious; yet these diseases were also spoken of as contagious. The reason of this change in medical opinion is, that it is now understood that these diseases arise from the operation of general and local physical causes.

Many examples might be adduced showing cholera to be of this nature. One of the most convenient, if not the very best, for deciding the question, is that of the epidemic attack among the pauper children at Tooting, in the beginning of the 'present year.

Tooting or Graveney, or Tooting-Graveney, as it is occasionally named, is a considerable village in the county of Surrey, in the western division of the hundred of Brixton, six miles from London, in a direction south south-west. It contains many seats and mansions of the gentry and wealthy merchants of the metropolis. Through the parish passes the river Wandle, turning mills for grinding corn and other mechanical purposes. The population in 1831 was 2063. The population was in 1841, 2840 persons, of whom 1429 were males, and 1411 were females. Of this total number in 1841, 618 were young children of both sexes, from 2 to 14 years, in the establishment of Mr Drouet, presently to be noticed. The proper population of the village, therefore, in 1841, was 2222; so that in the course of ten years, the increase had been about 159, or 16 persons annually. Reasoning from this fact, the population may be inferred to have been augmented in the course of eight years by at least 128 or 130 persons. This raises the population of the village at the beginning of 1849 to 2350 persons; and to this number must then be added 1370 or 1372, the number of children maintained in the pauper establishment of Mr Drouet at the beginning of the present year. The total population, therefore, according to this rating amounts to 3722; a number not far from the truth, and certainly not above the actual number, which, in all probability, borders on 4000 persons.*

Tooting, or Lower Tooting, or Tooting-Graveney, forms a small town or large village, and contains the greater part of this population.

The whole parish contains 680 imperial English statute acres. In 1841, the village contained 339 inhabited houses, and 17 unoccupied.

Tooting consists of Upper and Lower Tooting, the relations of which will be best understood by the following statements :—

Near the village flows a small stream, a tributary of the Wandle, which it joins a little to the west of Tooting; while the Wandle itself, pursuing a northward course and slightly west, after passing the town of Wandsworth, falls into the Thames a little below Fulham Bridge.†

The parish of Tooting is bounded by Streatham on the east, Mitcham on the south and west, and Wandsworth on the north.

The great road from London to Guildford and Farnham, which, in the days of mail-coaches, was wont to be traversed by the Poole Mail, passes through the county of Surrey in a south south-west direction, and the parish and part of the village of Tooting; and upon this road, at the fifth mile-stone, consequently nearer the metropolis by one mile, stands the hamlet which is called Upper Tooting. This place, however, is not within the parish of Tooting, but belongs to the adjoining parish of Streatham. One mile farther south and west, on the same road, is placed the village of Lower Tooting or Tooting Graveney. Another road branches off at this place on the left, supposing the visitor to proceed from London, from the Great Guildford and Farnham road; and this proceeds to Mitcham, Sutton, and Reigate.

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* Population in 1841, ...	2840
Pauper Children, ...	618
	2222
Population in 1831, ...	2063
Increase in 10 years, ...	159
In round numbers, 160, or 16 annually.	
Population of Tooting proper in 1841	2222
Estimated increase in the course of 8 years, . .	128
	2350
Pauper Children in Establishment of Mr Drouet in January 1849,	1372
	3722

† The river Wandle rises among the chalk hills at Croydon, and, after passing through Beddington, Carshalton, Mitcham, and Merton, in a northern direction, and slightly west, crosses the town of Wandsworth, under a bridge built in 1602, and joins the Thames below Fulham, as already stated. In this course it furnishes water-power to numerous flour-mills and valuable manufactories. Wandsworth is merely Wandlesworth.

The facts now stated regarding the course of the Wandle and its tributaries show that the whole of this part of the county has a general declination to the north and west towards the river Thames and its basin. The surface is, with the exception now stated, level and flat, and the principal elevations occur towards the east,—at Bleak Hill on the north-east, at Knight Hill, Timber Hill, and Beagar's Hill, on the east, and at Morden on the south. The soil consists of gravel mixed with clay, covered by a layer of vegetable and animal mould, varying from ten inches to two feet in thickness. The land of the parish is principally arable. The ground rests on the formation denominated London Clay.

This, it may be proper to explain, is a bed or deposit of clay varying from 150 to 250 feet, and, in some parts, 300 feet in thickness. The clay is generally chestnut-coloured near the surface, that is, from five to twenty feet down; farther down, it is of a lead colour; then, at the depth of thirty or forty feet, the whole mass is bluish; and, as it approaches the bottom of the deposit, it becomes almost black. The deposit is remarkable for containing *septaria* and numerous organic remains; shells among the aspondylous animals, and bones of fishes among the vertebrated classes, sometimes with tusks and bones of elephants and other remains of mammalia. This bed of clay contains little water, and whatever water is obtained from it, is turbid and brackish.

This formation of clay has been dug through in sinking wells at Clapham, Stockwell, Brixton, Norwood, Balam, Morden, Wimbledon, Richmond Park, and other places in the north-east side of Surrey. It is believed, indeed, to extend over the whole north side of the county of Surrey.

Below this deposit of blue or London Clay are found in some parts beds of oyster-shells and other marine shells; but the most usual is an extensive deposit of sand, which, from resembling that found near the surface at Blackheath, is sometimes called by the older geologists Blackheath Sand. The bed of shells now mentioned is not uniform, and is found chiefly on the north side of the county of Surrey, that is, not far from the Thames. The sand, on the other hand, is almost constant. It is of a fawn colour, loose at the surface, more compact below, and varies from ten and fifteen to forty feet in thickness. This deposit abounds with water; and when wells require to be made, the perforation must be carried entirely through the clay. Artesian wells are usually carried through the clay and the upper portions of the bed of sand.

Subjacent to this deposit of sand is one of chalk, of very great thickness, estimated in some places at between 800 and 900 feet. This abounds with oyster and other marine shells, sharks' teeth, and various other organic remains. At and near the surface, the chalk deposit is porous, loose, and dry. Lower down, it is more compact; and at two-thirds or three-fourths of its depth, is obtained the firm brownish chalk which is burned for mortar, and which is often called Dorking Lime.

The most recent and pointed information regarding the geological structure of this division of Surrey, namely, Brixton Hundred, is communicated by the account of the section of a deep well sunk at Streatham Common, in the immediate vicinity of Tooting Parish, by Mr Thomas Yeats. This well was sunk first through the London Clay to the depth of 100 feet, and, by a subsequent boring, to the further depth of 185 feet, forming altogether a depth of 285 feet, the greatest to which at that time (1824) perforation had been carried in that neighbourhood. The London Clay at this point was of considerable thickness, being not less than 180 feet, when it became much mixed with sand. At the depth of 200 feet, the auger went through a bed of shells, principally oysters, which was estimated to be 30 feet in thickness. At the depth of 235 feet, hard water was procured. At 240 feet was a bed of mottled clay, which Mr Yeats classes under the head of Plastic Clay. At 256 feet, was a bed of red, green, and yellow mottled clay, also plastic. This was followed, at 260 feet, by green sand with rounded carious flint pebbles; at 265 feet, by a mixture of iron pyrites and sand very hard; below this, to 278 feet, green sand; and there to 280 feet, light coloured sand. Below this last stratum was plenty of soft water.*

From this section it results, that, in the neighbourhood of Tooting, London Clay is the principal formation, and rests on a pretty thick bed of Plastic Clay.

These facts show that there is in the soil of Tooting nothing which can render it necessarily and naturally insalubrious and productive of disease. It is, indeed, a very healthy situation; and, though alluvial, yet the declination of the surface is quite sufficient to allow means for adequate drainage. It is true, that all argillaceous soils are retentive of moisture and not very easily made dry; but while the perforations by various Artesian wells tend to draw off all superfluous moisture, it is certain that Tooting is quite as salubrious as any other place in Surrey, and that neither its soil nor its climate possesses any peculiarities which ought to render it the easy prey of endemial or epidemic diseases.

It is very true that various adventitious circumstances, and probably neglect, tend to render the drainage less perfect than it ought to be. Thus, a stream, which crosses the Mitcham and

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* Transactions of the Geological Society of London. Second Series. Vol. ii. London, 1829. Vol xii. p. 135.

Streatham road, the tributary of the Wandle already mentioned, is often foul in the summer when the water is low and scanty. It is said not to be the subject of complaint in the winter season. Various ditches, however, it will be seen, which are either not kept clean, or which it is difficult to keep clean, are a considerable source of nuisance and offensive exhalation.

On the other hand, there is direct evidence to show that Tooting is a healthy situation.

Mr Erasmus Gilbert Livesey, who keeps there a boarding school, states that not only is it in general a healthy situation, and that he has rarely illness among his pupils, but that having formerly kept a similar establishment at Guilford, he never had his expenses for medical attendance so low, in proportion to the number of pupils, as they have been at Tooting. During last year (1848), he had in his establishment about fifty pupils, and altogether sixty-four persons within the premises, yet never was their health so good as during the last half year; and he had no deaths. The establishment of Mr Livesey is situate about half a mile distant from a particular turn of one of the ditches, which, from its being difficult to clean, and favouring stagnation and accumulation of filth, he calls the cesspool of Tooting. This spot is from forty to fifty feet long, and about seven feet broad.

This ditch, it may be proper to mention, is close upon a lane leading to the small town or hamlet of Garrett, noted for its mock and not very decorous elections, and which has acquired a dramatic reputation by the once celebrated farce of Foote, the Mayor of Garrett. Garrett itself belongs to the adjoining parish of Wandsworth.

The Registrar of Tooting further bears evidence to the fact, that the deaths in Tooting form a small annual average. He had registered no deaths from cholera except those taking place at Mr Drouet's establishment.

At this village is kept, by Mr Bartholomew Peter Drouet, an establishment for the accommodation and boarding of pauper children at a certain rate (4s. 6d.) weekly. The establishment consists of cottages and other small buildings, with about fifty-two acres of ground, which is employed by the proprietor in agricultural purposes. About one-eighth of the ground is occupied by the buildings and grounds of the asylum. The dormitories of the elder girls are situate in two old family mansions facing the main road in the village of Lower Tooting, and a portion of these houses is occupied by Mr Drouet himself and his principal officers.

That portion of the establishment appropriated to the accommodation of the boys, consists of a number of detached out-buildings, extending on the right or north-eastern side about half-way down, and on the left or western side the entire length of the playground. Beyond these detached buildings, on the same side, is a range of cottages, situate over a stagnant ditch passing along the end of the grounds. These cottages are employed as dormitories for the elder boys.

The detached buildings in the yard consist of seven distinct compartments, each compartment on the ground floor being 50 feet long, 10½ feet high, and 24 feet wide; and above these are apartments of the same dimensions used as dormitories for the younger children.

The cottage rooms referred to above, in which the elder boys sleep, form a range of buildings 150 feet in length. The boys' school-room is 91 feet long and 24 feet broad. The girls' school-room is of similar dimensions. The average number attending each school is from 500 to 600 daily. To the entire assemblage of buildings thus situate, the general name of Surrey Hall is given.

The ditch already mentioned, as that over which the dormitories of the senior boys are erected, formerly ran from Tooting to Wandsworth; but its direction is now changed, and it passes in a north-easterly direction towards the Surrey County Lunatic Asylum. After passing along the end of the asylum for a short distance, this ditch becomes considerably wider, and again returns towards Tooting, abutting on the eastern side of the asylum, and 349 feet from the centre of the main building of the institution.

In answer to a question put by the inspector, Mr R. Drouet stated, that this ditch had been cleaned about six weeks previously by a number of the elder boys and some men, and that the matter it contained had been deposited on the bank, in order to be used as manure for the adjoining land.

Besides this, there is in the adjoining field belonging to Messrs Rollison, nurserymen, at Upper Tooting, another stagnant and filthy ditch of extraordinary dimensions. This ditch, which is situate in a north-easterly direction between Mr Drouet's establishment and the adjoining fields, is connected with a large tank, which receives all the refuse from the Surrey Lunatic Asylum, situate at the distance of about a quarter of a mile. This ditch is about 3 feet deep and from 18 to 20 feet wide; and, when examined on Friday the fifth of January, the filth which it contained is reported to have been from 1½ to 2 inches from the surface, and the ditch, it is added, exhaled a most offensive odour. On the northern side of the field, it is stated that the ditch was dammed up or obstructed, for the express purpose of collecting filth in order to manure Messrs Rollisons' land.

This, however, is positively contradicted by William Rollison and Sons. According to their representation, the ditch referred to was formed many years previously by the then proprietor of the Springfield estate, of which Messrs Rollison's nursery is a part; and that person is represented to have, by permission of the inhabitants of Lower Tooting, diverted the common sewer from its ancient course, in order to obtain the means of irrigating the Springfield meadows. When Messrs Rollison purchased one portion of Springfield Meadows, the proprietor retained the right of damming the ditch in question, that he might still flood the meadows unsold; and Messrs Rollison consequently have no control in the matter.

They further say, that the manure is of little or no value, while its course through their grounds is a positive evil; and they have every wish that the sewer should resume its original course.

At first sight, Mr Grainger, the medical inspector, was inclined to order these ditches to be emptied and their contents removed. But, on further consideration, he was doubtful how far this measure might be safe, and he was inclined to think that, as the fall was not deficient, sending through them a copious current of water would be the best plan.

The village of Tooting is entirely supplied with water by Artesian wells; and the Reverend Dr Lord, rector of the parish, stated at one of the meetings of the Sanitary Committee, that the inhabitants were willing to place the whole available water of these wells at the service of the committee, if it were thought expedient to clean out the ditches and drains.

In the asylum now described at Lower Tooting, the following fifteen parishes in London and the neighbourhood farm or board their pauper children, viz., Kensington, Newington, St Andrews, Holborn, Wandsworth Union, St Pancras, Chelsea, Clerkenwell, Islington, Strand Union, Fulham Union, Richmond Union, St George's in the East, Kingston Union, and Streatham.

The whole of these amounted to about 1400 children of both sexes.

It appears that in the end of November and beginning of December 1848 the number of children was rather above 1400; indeed it is allowed that there were at certain times more than 1500. At the end of December 1848 and the beginning of January 1849, however, there appear to have been 1370 or 1372 children.

It appears that the children thus accommodated in the several buildings of Surrey Hall did not enjoy very good health. Cutaneous eruptions were very common, mostly, it is said, of pustular character. *Impetigo* is especially mentioned. Itch also prevailed among many of them. The bellies of the children were large and swelled; while the limbs were shrunk and extenuated; their complexion was pale; and their external appearance not that of children in health. Ulcers were observed on the extremities and feet; and, when these appeared, they were always difficult to be healed. In several the joints are stated to have been in a morbid state; and ophthalmic disorders were so prevalent, and so little manageable, that one practitioner thought them contagious; and the children so affected were placed in separate wards. It is also important to observe that, during November and December, various attacks of diarrhœa and dysentery had taken place; and some of the children were convalescing from dysentery in the course of the latter month.

In short, the morbific properties, and the debilitating influence of the management at Surrey Hall, on whatever they depended, appear to be at once efficient and manifest. Thus, at one of the inquests on the St Pancras children, it is proved that, among the children sent from that parish in the summer of 1848, considerable numbers had not been long there when they presented various unequivocal marks of general impaired health. These boys, to the amount of at least 156, were sent to Tooting in May 1848. The directors of the poor had ordered monthly reports on the state of the health of these boys to be returned to St Pancras Union. The first report was presented on the 8th of June, when some of the children complained that they had not so much food as in the workhouse, and several had run away. On the 11th July a report was presented by Mr Douglas, approving of the cleanliness and general management of the establishment at Surrey Hall, and stating that the boys were reconciled to the place, and more orderly than formerly.

On the 22d of August 1848 a report was received from Mr Johnson, one of the district medical officers, stating that he had been requested to visit two boys,—one, Joseph Sherrard, aged 11; and the other, Henry Sherrard, aged 9,—who had been removed from Tooting to the St Pancras Workhouse. The former had, in consequence of a hurt, a sore in the leg, which would not have taken place in a boy in a sound state of health. The latter had on the head a wound, alleged to have been the effect of a blow inflicted by the schoolmaster. The children, who were residing with an uncle and aunt in William's Mews, were both in a condition of great feebleness and emaciation. In consequence of the receipt of this report, the board of directors sent to Tooting Mr Robinson, the workhouse surgeon, and Mr Johnson, in order to examine the children of the St Pancras parish. Mr Robinson returned, on the 28th of August, a report stating that there were 58 cases of ophthalmia and other diseases, chiefly cutaneous eruptions, and that the health of all the children was more or less deteriorated. The following is the concluding paragraph of the report:—

"I did not fail to notice, from the examination of the above-mentioned boys, that they had undergone a change certainly not for the better. The general characteristics were wasting of the limbs, debility, boils, &c. Although some 15 or 20 boys, upon leaving the workhouse, were more or less indisposed, I am prepared to say that they were not so delicate generally as at present. As to the cause which may have operated in producing this alteration, perhaps recent removal from friends and change of air may have contributed; but the symptoms are decidedly characteristic of bad food or insufficiency of food. With regard to the cases of the two children, Sherrard, one of whom is since dead, Mr Johnson has reported; and I need not add anything to that report. I think a great deal of severity, not to use a harsher term, has been exercised by the masters and others in authority, as well as some out of authority, towards the boys."*

Thus, so early as the 28th of August, three months after the arrival of the children at Tooting, it was known to the St Pancras guardians that their health was not satisfactory, and was in truth much and decidedly deteriorated. To the alleged deficiency of food it will be requisite afterwards to recur.

Neither did cholera attack this establishment altogether without giving some previous warning. On Friday the 15th of December three girls were attacked with diarrhœa and vomiting, which were speedily followed by collapse. It is stated that the occurrence of these cases of gastric disorder were ascribed by the resident medical officer to cold and dampness. It is not mentioned whether they recovered or not. But it is probable that they did; as, had they terminated fatally, it is scarcely possible to conceive that measures should not have been taken, to ascertain particularly the state of health of the other children in the institution. No inquiry, however, as to the presence of diarrhœa among the children appears to have been made; and, accordingly, no prophylactic means were adopted.

It is, nevertheless, well established that, during the end of December 1848, diarrhœa had been prevailing very extensively among the children. It is distinctly in evidence in the report of Mr Grainger, that, "as in all similar circumstances, a large amount of diarrhœa has been prevailing among the children at this establishment, viz. Surrey Hall, both previous to and since the outbreak of cholera; and, on the 5th of January 1849, one of the assistant masters stated in evidence that the boys had been purged during the last (the previous) fortnight, and especially since yesterday week."

This carries back the prevalence of diarrhœa among these children to the 21st or 22d December 1848, and to Thursday the

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* Report of 28th August 1848, by H. C. Robinson, Surgeon to St Pancras Workhouse.

28th of December 1848. One of the female teachers also stated, on the 5th January, that "many of the children had been taken ill with pain in the bowels;" and the resident medical officer allowed, that many of the children attacked by cholera had informed him, that they had suffered from diarrhœa before the attack, some for one or two days, others for a longer period.

The truth is, that the disease had commenced in its incipient and premonitory stage evidently about the 21st or 22d; but probably the poison had not acquired that degree of virulence, as to destroy so rapidly and speedily as it afterwards did. The cases of diarrhœa after the 28th December must be regarded as cases of cholera in the early stage. Fatal cases then began to appear.

It is, if not distinctly stated, at least insinuated with considerable confidence by Mr Grainger, that, had the warning, which the occurrence of these cases in the month of December was calculated to convey, been properly understood and acted upon, in all probability much of the subsequent sickness, and all the mortality might have been prevented from taking place. This opinion he founds on the fact, that in the month of December, out of 400 children in the Mile-End Workhouse, 60 were attacked by violent purging and vomiting. Appropriate medical treatment, however, was immediately adopted by the surgeon; and not one of these children presented symptoms of cholera. Every one conversant with the disease must admit that to check the preliminary diarrhœa is a point of the highest importance.

Among the inmates of Surrey Hall, at all events, cholera broke out somewhat suddenly and violently at the close of 1848.

According to the accounts first published, it was stated that the disease broke out on the 3d of January 1849, and on the night between the 3d and 4th January. But, according to the report of Mr Kite, the resident surgeon, as subsequently given before the Coroner, the first case took place on Friday the 29th of December, and the first death on the 30th. On the same day more attacks must have taken place; for on the 31st of December three children died. On the 1st of January, 3 are said to have died; on the 2d, 7; on the 3d, 5; on the 4th, 12; on the 5th, 19; on the 6th, 14; on the 7th, 11; on the 8th, 20; on the 9th, 14; on the 10th, 10; on the 11th, 5; on the 12th, 9; and on the 13th, 8. These numbers differ somewhat from those rendered to the Board of Health, to which it is convenient to adhere.

On the 4th, 60 children were reported as labouring under distinct cholera, and of these 16 were fatal. On the 5th, 15 cases were reported, and 10 deaths; on Saturday the 6th of January, it was reported by Mr Kite, the surgeon, that 40 new cases had taken place since four o'clock P. M. of the previous day; and during the same time, 12 deaths had taken place. At this date, namely, Saturday the 6th of January 1849, the cases stood as follow:—

Number of cases of cholera since the commencement,	229
Deaths, ...	52
Under Treatment, ...	160
Recovered, ...	16

On Friday evening, the 5th, the Guardians of the Holborn Union removed of the children belonging to their parish, 186 in number, to the Royal Free Hospital in Gray's Inn Lane, either 154 or 156, the latter being the number given by Mr Whitfield the surgeon. 30 children, too ill to be removed, were left at Tooting. The same evening the Directors of St Pancras Parish ordered the children entrusted to their care, amounting to between 200 and 300, to be removed; and in consequence of the Wandsworth and Clapham Union, and the parishes of St Mary, Newington, St Mary, Islington, and St James's, Clerkenwell, adopting the same course, one-half of the children had been removed from the Tooting Asylum. The only children that remained were those of Chelsea, and the parish of St George's in the East, St Luke, and Clerkenwell.

On Saturday evening, and during the night, 7 deaths took place; and between Saturday night and Sunday at 5 P.M., 9 more; making altogether from Saturday the 30th December 1848 to Sunday the 7th January 1849, 68 fatal cases. The new cases on Sunday were 13.

After this period cases of cholera continued to take place both among the children removed, and among those left at Tooting, some terminating fatally; and both cases and deaths were reported regularly to the Board of Health. On Monday the 8th January, 10 new cases were reported as having taken place at Mr Drouet's Asylum, and 7 deaths; on Tuesday 9th, 14 new cases and 16 deaths. On Wednesday the 10th, and Thursday the 11th, 17 new cases took place, and 22 children died. The number under treatment was stated to be 103. On the 12th of January, the disease had undergone some abatement. The new cases were only 2, but there were 6 deaths. On the 14th, the new cases were in like manner 2, but 13 deaths occurred. On the 15th, the official report rendered to the Board of Health by the resident surgeon, was—

Death from cholera, . . .	1
Death from consecutive fever, . .	3
Under treatment, . . .	84
Convalescent, ...	79

No new case had taken place, but there were two of disordered bowels

On the same day, Mr Popham reported that there was not in the establishment at Tooting a single case of cholera; that is, evidently understanding no new case. It was then reported on the 17th, that since Sunday the 14th, no new case had occurred; one death took place on the 17th; 16 cases were convalescent, and 65 were under treatment.

This time appears to have been the termination of the epidemic, for, on the evening of Saturday the 20th of January 1849, the report was to the following effect:—

The total number attacked from the 29th December to the 20th of January, amounted to 360. Of these, 150 had died either from cholera or its effects. 43 were still under treatment; and 167 were convalescent. No new case had taken place on 22d since the evening of the 20th; and no death during 48 hours. The cases under treatment were several of them suffering under the secondary fever.

Some discrepancy is observed in the numbers returned, owing probably to the slightly different heads under which they are ranked. Thus, some difference of opinion appears to have existed, whether certain cases were to be referred to the head of diarrhœa, or cholera, and to that of mesenteric disease or cholera. It is very likely that a child labouring under any intestinal disorder would be carried off by cholera. Altogether the number of deaths up to the 20th January, returned as caused by cholera, is 155. The total number of deaths registered as having taken place in Surrey Hall and in children removed from it, in the course of three weeks, amounted to 182. Of the 27 residual cases, it is probable that the deaths were more or less closely connected with the epidemic visitation.

Various cases took place among the removed children; those of St Pancras at the Royal Free Hospital, those of Holborn Union at the Workhouse, and among some children sent to Margate. These, however, it is unnecessary here to specify.

Mr Grainger visited the children still at Tooting on Thursday 25th January, along with Dr Farre, by order of the Board of Health. With the exception of the sick and convalescent, the only children now at Mr Drouet's were those belonging to the parishes of St George's in the East and Chelsea. The total number of children now at Mr Drouet's was 175, belonging to St George's in the East, and 97 belonging to the parish of Chelsea. Among 68 boys belonging to St George's in the East, examined by Dr Farre and himself, 17 had itch or other cutaneous diseases; and among 70 girls, 25 were suffering from cutaneous diseases principally itch. Among 45 boys belonging to Chelsea parish, 14 were labouring under itch or diseases of the skin; and among 32 girls, 7 were suffering under similar disorders. Many of the children had swelled bellies, emaciated extenuated limbs, and pale flaccid skin. Sores, the consequence of chilblains, were very common.

51 children were under treatment from the effects of cholera; most convalescent or approaching to convalescence, few were now seriously ill. The last death took place on the 16th January, and the last new attack on the 18th January.

Of children belonging to the parish of St George's in the East, 20 were under treatment; of those belonging to Chelsea, not quite 12.

Among the children belonging to St George's in the East, 26 new cases and 16 deaths had taken place; and among those belonging to Chelsea, 11 new cases and 14 deaths,—subsequent to the 6th of January. Between the 7th and 10th January inclusive, 23 new cases and 8 deaths among the childred of St George's in the East, and within the same period 9 children, were attacked among those belonging to the parish of Chelsea.

The disease as it appeared among the pauper children at Tooting is stated by Mr Kite, the resident surgeon, not to have been preceded by the usual premonitory symptoms; to have commenced at once with sickness, vomiting, and diarrhœa, and then to have proceeded speedily to the stage of collapse, with great weakness. Mr Popham, the surgeon to St Pancras, gives a view nearly similar.

This statement, however, is completely contradicted by the report of Mr Grainger, and by a subsequent admission of the surgeon, which has been already given above. These cases were preceded by diarrhœa, exactly as in other attacks.

It was further ascertained, by means of an inquiry suggested by Mr Grainger and conducted by several medical gentlemen, after the disease had been established for several days, that on Saturday the 6th and Sunday the 7th January, there were 38 cases of diarrhœa, though the number of children had been by this time diminished one half by removals. Of these cases of diarrhœa, only one proceeded to cholera. It is idle, therefore, to assert that cholera began in this place suddenly and without warning. It is clearly proved by the whole course of the facts that have come to knowledge since the inquiries were made, that it began at Surrey Hall exactly in the same manner as it has commenced everywhere else—that is, by diarrhœa and gastric disorder lasting for several days.

On the other hand, Mr Popham states, in his evidence of Friday the 19th January, that when, on Saturday the 6th, he examined the St Pancras children, 96 in number, he found only four or five instances of diarrhœa among them; and that in one case there were no premonitory symptoms; and the child aged between four and five years died in two hours from the commencement of the attack. Mr Penny, of Walworth, who had been called by

Mr Drouett on the 5th, stated that he examined 400 boys, and found among them only 4 instances of diarrhœa, and among 150 girls 11 instances of diarrhœa. These statements it is not very easy to reconcile. They may possibly receive some new explanation afterwards.

The cases appear to have been rapid in progress; and, indeed, this result clearly follows from the fact of the great number of fatal terminations between the 1st of January and the 9th, amounting, according to the reports during that space of time, to 93.

Notwithstanding this, and that all of the medical officers of the unions and parishes concerned who had seen the cases up to the 8th, declared the disease to be cholera, one surgeon expressed publicly an opinion that the sickness of the Tooting pauper children was a bilious fever with diarrhœa. It is of little avail to dispute about a name; and it is, perhaps, of no great moment whether the disease be called bilious fever with diarrhœa or not; but it is quite impossible to doubt or deny that the disorder affecting these children was cholera, and that of a very active and virulent character.

All doubt upon this point, however, has been since completely dispelled. By the united testimony of the resident surgeon and various medical officers sent from the metropolitan Parishes and Unions, it has been established beyond question, that the disease which caused the sickness and mortality was cholera and nothing but cholera, or its subsequent effects. The symptoms, according to the testimony of all these observers were, first, in general the preliminary diarrhœa, then, in rapid succession, discharges of watery and rice-water liquors from the bowels, with vomiting and cramps, then coldness and blueness of the extremities and surface, suppression of the urinary secretion, and, in the worst cases, the fatal termination. Several bodies also had been inspected; and the usual appearances found in the bodies of persons destroyed by cholera were recognized.

The consideration of the causes of this disorder has occupied the attention of many observers. None seem to think of contagion; and, indeed, it must be difficult to imagine a contagious disorder introduced among these children and affecting so many in so short a space of time. On the other hand, the opinions of the medical observers all look to one of three or four circumstances as causes of this outbreak of disease. These are, the local situation of the establishment, with two large stagnant foul ditches in the immediate neighbourhood; the state of the atmosphere—that is, some atmospheric poison; the imperfect warming of the apartments and insufficient clothing of the children; the great number accumulated within an establishment rather small; and a form of dietary not sufficiently nutritious.

1. The local situation may be understood from what has been already stated. There is little doubt, that masses of water or watery soil, whether stagnant or not, are favourable to the formation of cholera during an epidemic state of the atmosphere. Much more is the disease likely to be developed in situations in which the soil is saturated and the air impregnated with moisture from foul stagnant ditches.

Yet was all this unfavourable local influence artificial and adventitious in origin. It has been shown how hurtful must be the proximity of the large and extensive ditches or receptacles of stagnant water. Either from this or some other cause, the whole locality was rendered damp. "The yard or play-ground," says Mr Grainger, "was damp and wet, owing, as it appeared, to its limited size, and to the buildings by which it is more or less surrounded."

Another mode of contaminating the local atmosphere of this abode is too remarkable to be omitted. About five or six months previous to the close of 1848, according to the testimony of Mr Walter Chapman, one of the then medical attendants at Surrey Hall, a low range of buildings, constituting one long room, was erected in the immediate vicinity of a yard or court, in which were kept a large number of animals,—pigs, cows, horses, and poultry. These buildings were placed very near to the two foul open drains or ditches formerly mentioned. When this building was erected, and before any of the children were placed in it, Mr Chapman expressed his opinion that the Commissioners of the Poor or of the Board of Health would insist on the removal of the pig-sties, if the children were to live there. Notwithstanding this representation, 150 children were placed in this apartment. The present medical officer also expressed his opinion of the unsuitableness and dangerous character of this place as a residence; and, in consequence of all these representations, it is believed some of the animals had been removed; but, at the date of the report of Mr Grainger, 5th January 1849, a large number of poultry were still kept in this court, and some pigs were also its occupants.

It results, further, from inquiries made by Mr Grainger, that, notwithstanding all these factitious causes of insalubrity as to the establishment of Surrey Hall, the inhabitants of the village itself enjoy most perfect health. No case of cholera, or any other serious disorder, had taken place either among the respectable and wealthy inhabitants of the village or among the labouring classes. The medical officer of the district made particular inquiry, and ascertained that neither any of the inhabitants nor the children of the poor had been labouring under diarrhœa, or presenting any symptom of cholera. There has been, indeed, in this village, no excess of disease above the average.

Mr Withall, Registrar of Tooting, stated that he had registered about 150 deaths from cholera from the Surrey Hall Establishment since the 29th December 1848. The population of the district is from 9000 to 10,000 persons. No deaths had taken place from cholera in the whole district except those at Mr Drouett's establishment. Only seven deaths had been registered during the last quarter, exclusive of those at Surrey Hall.

2. As to the atmosphere, our knowledge is very uncertain. All that can be said is, that for a considerable time past—four months at least,—the atmosphere of many places on the coast and the rivers of this island has been charged with those principles which favour the production of cholera. That the disease has been so virulent in character and rapid in progress among the pauper children at Tooting, is probably to be ascribed to the fact, that the peculiar epidemic state of the atmosphere, as well as the miasmatic condition of the locality, was strongly aided by the imperfect clothing of the children and the cold humid state of their apartments at this season of the year. One medical witness (Dr Bermingham) states, that all the children whom he saw, appeared to be imperfectly clothed, considering the cold of the season.

3. One cause to which a considerable number of witnesses attach great importance is that of the small and confined accommodation, both during the day and the night, in proportion to the number of children. It has been already stated, that the numbers accommodated in the Surrey Hall Asylum at Tooting in 1841 were 618; and this number was probably as great as the establishment could conveniently contain, and certainly as great as any single individual could properly and satisfactorily manage with due attention to health, comfort, morals, and education. The numbers, nevertheless, soon rose above this standard. From facts brought out in the course of the late inquiries, and especially some which transpired in the course of a negociation between the guardians of the Holborn district and the proprietor, it results that, between the 25th of October 1847 and the beginning of November in that year, there were in the asylum 800 occupants, pauper children as we understand. The license is stated, at the same time, to extend to 1200. On the 9th November, the guardians had resolved to send thither 90 boys, who were accordingly removed soon after the 19th November; and, in the course of a month after, several more boys and some girls were sent. On the 2d of December, about one hundred girls were sent; and, at the end of 1847, 211 children from the Holborn Union was the number then in the Tooting or Surrey Hall Asylum. In this manner, the number of children was raised, at the end of 1847, above one thousand. It

appears, from the testimony of Mr Hall, the Assistant Poor-law Commissioner, that on the 14th December 1847 there were 1065 inmates in the asylum.

It appears that, at the same time, this functionary thought the accommodation too small and limited; and he recommended the numbers in the schools to be confined within certain limits; not more than 400 boys for the large school; not above 160 girls for the senior girls' school; 120 for the junior girls'; nor more than 250 for the infant school. As these numbers amount to 930, it leaves 135 unprovided for; and the statement is equivalent to saying that there were at least, during the daytime, 135 children more than ought to be.

The numbers, nevertheless, continued to increase. The guardians of the parish of St Pancras resolved on sending to the Tooting Establishment the children under their care; and, accordingly, 156 boys were sent in May 1848, as already stated; and in November and December, 110 girls were in like manner sent, making of both sexes 266 children. More must have been speedily added; for it is in evidence, that at December 1848, the Guardians of St Pancras had at Tooting 282 children. By this addition the number of pauper occupants was raised to 1347 persons; and as they amounted to 1370 or 1372 at the beginning of 1849, more must have been added.

In this manner, in the course of seven or eight years, the population of this institution has been more than doubled; and during the last 20 months, it had risen from 800 to 1370, an augmentation of more than 500 persons.

It is allowed that the institution was enlarged by the addition of new buildings; but it is much more than doubtful, whether the increased accommodation was in any sense or degree commensurate with the increased number of persons accommodated. It is stated by many of the witnesses, that the sleeping rooms were excessively crowded, and that, in various instances, three children were sleeping in one bed. Upon this point it is unnecessary to enter into particular details. It is sufficient to state, that the establishment contained 640 beds, which at the rate of two children in each, could accommodate not more than 1280, leaving, consequently, 90 children unprovided for. These 90 must have been dispersed among the others; so that 90 beds must have held 3 children each.

The great evil, in short, was crowding so many young persons within apartments so limited, that the means of ventilation either during the day or night were quite inefficient.

Dr W. Marsden, one of the medical attendants at the Royal Free Hospital, to which it has been stated the Holborn Union children were removed, took some pains to ascertain exactly the available amount of respirable air. He states that the total atmospherical contents of the 44 (48) dormitories at Tooting amounts to 196,705 cubic feet. Deducting for bedsteads and the persons of the children $\frac{1}{20}$, gives 186,870 cubic feet, and he infers that there would be left for each child, not quite 136 cubic feet of respirable air, or an amount equal to what would be contained in a box 5 feet 2 inches in every direction, that is, length, breadth, and depth. Now, it is only necessary to imagine a box of these dimensions air-tight, and to place in it a boy or girl for eight or ten hours to breathe over and over again the same air. It is true that the 1370 boxes were not exactly air-tight; but they admitted only a quantity of air which must, during the night at least, have been respired over and over again; and if it was at all removed and other supplies of air admitted, these new supplies entered the chambers loaded with the emanations of decomposing animal and vegetable matters from the neighbouring ditches and drains, and the air contaminated by the respiration of pigs, poultry, and other animals, as well as the exhalations and excrements of those animals.

Dr Marsden argues that the quantity of air contained within the 5 feet 2 inch boxes, with doors and windows closed, is not adequate to support life for more than 8 hours,because every expiration yields 4 per cent. of carbonic acid gas. The boys' schoolroom, he states, which was occupied for 3 hours twice daily, contained 19361 cubic feet; and deducting $\frac{1}{20}$ for the persons of the boys and the furniture, there could be only 18583 feet, or there could be only 37 feet for each boy. Ventilation was, in short, very insufficient. From all these facts, and from what is known as to the effects of confinement within the hold of a vessel upon cattle in the voyage from Holland, Dr Marsden regards the mischief produced as asphyxia, and not cholera.

It is not of much moment to dispute about the exact inferences deduced. The premises may be admitted as useful facts, while the conclusions drawn are different from those given. It is sufficient to show under this head, that there was a most deficient system of ventilation, a most imperfect supply of fresh air, considering the number of human beings requiring to be supplied with that essential element of existence and health. If the supply of fresh air was inadequate, then it could not fail to operate on the general health of the inmates. The blood, overloaded with impure air, and not adequately renovated, would become diseased and unfit for nutrition; and the health thus impaired would render the children easy victims to any disease, to the causes of which they might be exposed, and especially to one dependent on the influence of a morbid poison, such as there is every reason to believe cholera to be.

4. On the subject of the kind and allowance of food for the children, there was at first some difference of opinion. The Guardians of the Holborn and St Pancras Union regarded the allowance of food as sufficient in quantity and good in quality, at the periods when they agreed to send to the Tooting Asylum the children of their respective parishes; and for several months afterwards, at their periodical visits, the reports which they made to the General Board were to the effect, that the food was adequate in amount, and that the children were thriving on it. On the other hand, the practised eye of some of the medical officers had seen in the aspect of the children particular appearances which led them to doubt whether the food was sufficiently nutritious. The statement of Mr Robinson has been already mentioned. Latterly, the whole of the medical officers examined agree in representing the food to be deficient in quantity, and, in the quality and form in which it was given, not sufficiently nutritious. The dietary is the following:—

BREAKFAST.—The breakfast every day is the same—namely, pottage, composed of flour, arrowroot, and milk, with water and salt in sufficient proportions: this is for the strong children. The infants—those newly admitted, and the weakly, have boiled bread and milk. The allowance of bread to the healthy children is according to age, being six, five, and four ounces each.

DINNER.—There are three meat dinners in each week—viz., Sunday, Tuesday, and Friday. The quantity of meat, free from bone, to each child, is regulated according to age, being five, four, and three ounces each, with three quarters of a pound of potatoes—if with cabbage, unlimited. On Monday, Wednesday, and Saturday, soup made from the liquor in which the meat had been boiled, assisted with legs and shins of beef, peas, and a proper quantity of vegetables, pepper, salt, &c.; each child one pint, with bread, on these days, the same quantity as at breakfast.

On Thursday, suet pudding, the quantity being twelve, ten, and eight ounces, according to age, &c., to each.

SUPPER.—The suppers every evening are either bread and butter or bread and cheese; sometimes treacle, with milk and water. Should milk be scarce, which sometimes may be the case, then the children have good broth.

Little children are dieted in the best way I can, as no fixed diet can be adopted. Some have meat and porter daily.

In sickness, the diet is regulated by the doctor.

It is needless to enter into the particulars of the dietary. The main charge brought against it, is, that it was too limited in quantity, and that the food was given in a form too liquid. The gruel or stirabout provided for breakfast especially is represented as quite liquid, and after taking it, the children complained, whether right or wrong, that they were as hungry as before. Then the allowance of bread is alleged by all the medical witnesses to have been too small. And, lastly, it is stated, that the soup provided for dinner was not nutritious,—that the potatoes were of bad quality,—black, and unfit to be used as human food; (Evidence of Mr Wynch of the Holborn Union, on 9th and 30th May 1848); and that, in short, there was a general system of scanty allowance and short commons.

It appears also from the evidence of the same witness, that whatever might be represented in the Diet-Table, the Guardians had no assurance that the children actually received the allowances there specified.

The medical witnesses, by whom the evidence is given as to the deficient quantity and innutritious quality of the food, are Dr Bermingham, Mr Whitfield, Dr Peacock, Dr Marsden, Mr Jackson, and indeed almost all who were interrogated on the subject.

Dr William Marsden, already referred to, took some pains to ascertain experimentally the effects of the diet of Tooting upon the inhabitants of Surrey Hall.

He compared the children who came from the Tooting Asylum with 25 of the Welch School boys. The aggregate age of the Tooting children was 255, that of the Welch boys 259. He weighed them carefully, and found that the weight of the Tooting Asylum children was 1.339 pounds 8 ounces; and that of the Welch School boys, 1516 pounds 12 ounces; giving a balance in favour of the Welch School boys of 176 pounds 12 ounces. The children from the Tooting Asylum measured in the aggregate 161¾ inches round the arm, while the Welch School boys 179¾ inches, giving 18 inches in favour of the Welch children. Conversely, the boys from the Tooting Asylum measured 595 inches round the abdomen; while the boys of the Welch School were only 567½ inches, giving 18 inches less for the circumference of the abdomen than in the Tooting children. The inference which Mr Marsden deduced from this fact of the large state of the belly in the children from Tooting Asylum was, that their food was too liquid, and not sufficiently nutritious; for in all instances in which the limbs are small and the abdomen large, this arises from the kind of food, and is an indication of its innutritive qualities.

It is unnecessary to enter into the question of the nutritive or innutritive qualities of the dietary, as all that will probably be made the subject of more deliberate inquiry. Meanwhile, it is obvious that the dietary was not only allowed to be sufficient, in quantity at least, by the guardians of two of the parishes, but it is very doubtful whether its alleged low rate be sufficient to account for all the effects ascribed to it. It may be asked, are the children of the poor and working classes maintained at their own houses much better fed? Are they not often worse? These questions may be resolved by reference to the Reports of Mr Chadwick. The allowance of food might be sufficient, yet it might not be digested. It appears that the great evil with these children was the confinement and the want of exercise. The great means of counteracting even imperfect feeding is the sense of freedom, the fresh air which children enjoy, and constant exercise. All these elements of health were either deficient or much curtailed in the case of the children of the Tooting Asylum. They were confined nearly as much and as completely as if they had been a large prison. Never were they permitted to get out; and even when relatives applied to see them, they were permitted only to go the length of the gate. Several, it is stated, ran away. It is not too strong a conclusion to say, that the confinement and want of exercise were as hurtful as the deficient food, if deficient it was.

5. Lastly, it appears from the accounts given by the Medical Officers of the Free Hospital, that the Children of the Holborn Union were imperfectly clothed, and that none had any flannel next the skin. To this some may be disposed to answer, that many children, especially among the working classes and poor, are brought up without ever having flannel, and apparently without suffering from it. This may be true; but it is to be remembered also, that many of these children are cut off during the early years of life by diseases, the effect of exposure to cold, and imperfect clothing generally; and it is impossible to deny, that, in a climate like this so variable, and with winters so cold and moist, the only mode of maintaining the action of the skin in a healthy state, and consequently protecting the important organs of the chest and abdomen, is by the use of flannel during the cold period of the year. It may also be safely asserted, that the use of flannel under-clothing upon the chest and abdomen would have contributed greatly to have protected the inmates of the Surrey Hall Asylum from the operation of the epidemic state of the atmosphere.

Thus the circumstances specified as concerned in the production of cholera at Surrey Hall may be shortly stated as the following:—1*st*, the local and physical peculiarities of the buildings; 2*d*, the state of the atmosphere acting on these physical peculiarities; 3*d*, imperfect and inadequate means of ventilation; 4*th*, food insufficient in quantity, of questionable nutritious qualities, and not presented in the proper form to maintain health and strength; and *5th,* the want of sufficient clothing.

No evidence of contagion or contagious propagation has been given, or appears to be expected. One or two nurses have been attacked by the disease, and one medical assistant had a slight attack. These are explained by the circumstance that these persons were in the poisonous locality, and were exposed to the atmosphere of Surrey Hall. Various cases occurred among the children removed from Tooting. These as evidently depended on the fact, that the poisonous principle had been lurking in their systems for days previous to the manifestation of the characteristic symptoms and effects. That no case of cholera has appeared in the neighbourhood or in the village of Tooting, has been already mentioned. In short, the conclusion appears to be irresistible, that cholera at Tooting Asylum was the result of circumstances inseparably connected with that establishment; that it was not imported from without, but arose independent of contagion, and that the causes now referred to, were in a great degree, if not altogether, adventitious and acquired; and that, consequently, by the exercise of proper precaution and care, they might have been prevented from producing the effects which resulted.

In confirmation of the last conclusion now stated, the fact of the exemption of the children of the Mile-End Workhouse has been already mentioned. Another similar fact is adduced from the history of an establishment for pauper children at Norwood, which, like Tooting, is in the county of Surrey. In this establishment, kept by Mr St Aubyn, there were at the beginning of the present year 1114 children, and of these only one had itch. Among 530 children in this establishment, taken indiscriminately, namely, 200 boys, 200 girls, and 130 infants, and examined by Dr Farre and Mr Grainger, there was no case of itch, and only twelve instances in which cutaneous disease could be said to exist at all. In other respects, these children were in the most perfect health.

It is unnecessary, and would be improper at present, to say one word on the proprietor or superintendent of this establishment. The several verdicts of coroners' juries have already expressed opinions, the correctness of which can only be determined by careful judicial inquiry. Three of these juries have returned verdicts of manslaughter. The jurors have spoken in decided terms as to the share which the proprietor and his conduct may have had in producing so much sickness and mortality. It is nevertheless very idle and short-sighted to lay the whole blame upon him. The proprietor of Surrey Hall acted only after his kind. Money was to be made by providing, for pauper children, food, clothing, lodging, and education, at certain rates; and it would have been very unreasonable or very silly to expect, that he was to undertake all this labour and responsibility without being sure of making money. The superintendent of Surrey Hall, therefore, is not more to be blamed than any other man or any set of men. But other parties are as deeply involved in this matter as the superintendent and contractor.

In the first place, the Guardians of the different parishes and unions went voluntarily into the arrangement, and, by so doing, gave it the sanction of their authority.

In the second place, the Poor Law Commissioners and their agents, either gave this arrangement a direct sanction or a tacit approbation, and allowed to be carried on, within seven miles of Somerset House, transactions which have been characterized in language not to be repeated in these pages. Something has been said about their having no power or control over this establishment. If this be the case, it is the first time that these gentlemen have seen any limits to their authority, or bounds to their proceedings. Had the question been the employment of a medical officer to a Union in Cumberland, Northumberland, or the extremity of Cornwall, the Poor Law Commissioners would have had no difficulty in showing their willingness to exert authority at these distances. But it seems that within seven miles of London concentrated authority fails to act. Such at least seems to be the view taken by Mr Richard Hall, Poor Law Inspector :—

"I think the establishment in Tooting is not under the control of the Poor Law Commissioners. I know no regulations of the Commissioners by which this institution can be governed ; but still they require, from time to time, certain information respecting it, in consequence of which I visited it, as my predecessors had done. I visit as the informant of the Poor Law Board. I do not consider that I have authority to make any orders for the establishment ; and I believe the opinion of the Poor Law Commissioners is, and always has been, that they have no power to make such orders. I have certainly considered the provisions of the new Poor Law with reference to Mr Drouett's and other similar establishments. The first of such establishments that came under my notice, with reference to the power of the Commissioners to regulate them, were two contractors' establishments, in which the adult paupers of the City of London Union were kept, at Marlborough House, Peckham, and at Stepney Green. I was led to remark, soon after I came into office, that no workhouse rules were enforced in these two establishments. I found that, at some previous period, an order had been issued to the Board of Guardians, containing regulations for their workhouses ; that in 1842, this order and similar orders had been revised by the Poor Law Commissioners, with a view to embody the regulations of workhouses in a general order ; but in process of deliberation, it was decided that the City of London Union should not be included in the general order. The City of London Union, therefore, is under no regulations as to the management of its workhouses, and I believe those establishments stand upon the same footing as Mr Drouett's establishment. I think that the Poor Law Commissioners can exercise no power directly over Mr Drouett's establishment; but I think they can do so indirectly by requiring the parishes to withdraw their children."

If such be the state of matters and authority as to the Poor Law Commissioners, it may well become a question what good is done at all by a system of machinery so complicated and expensive?

In the third place, it must occur to every one that the Sanitary Commission have surely been created in vain, if such specimens of poor-house regulation and domestic economy as that furnished by Tooting have received their sanction and approbation. Or is it to be ascribed to the clause in the Sanitary Act, by which the metropolis is or was to be exempted from their powers, that the multiplied sources of insalubrity mentioned in the report of Mr Grainger were permitted to exist? It appears, on the one hand, that the City of London Union is exempted from the controlling powers of the Poor Law Board; and that, on the other, the formation of drains and ditches, and the establishment of all sorts of nuisances in the metropolis and vicinity, is not within the power and the authority of the Sanitary Act. It may well become a subject of inquiry, what is the nature and use of that system of legislation, which overlooks and neglects matters most requiring to be placed under some regulation?

Lastly, the window tax is manifestly to be charged with a considerable share of influence in the matter of the Surrey Hall Asylum. With the proprietor of that, as with those of all similar establishments, it must have been a primary object, not only to have the buildings and apartments constructed on as moderate and limited a scale as might be practicable, considering the uses to which they were to be applied; in other words, to make them of dimensions no larger nor more spacious than to accommodate their occupants, and to place in them after construction as many occupants as they could be made by any means to contain;—but also to construct these buildings with the smallest possible number of windows, and to have no unoccupied room, no superfluous channels for the admission of light and air. It could not be expected, that the contractor was to have large, spacious, well-aired, and well-lighted apartments with elevated cielings, if small narrow chambers, with few windows and low cielings, would answer the purpose. The window tax has been the cause of much mischief to domestic architecture generally, and of incalculable evils to all classes of the community in this country, but especially to the working classes who ply their labour within doors. In workshops, manufactories, and in every possible situation in which men and women are assembled to work, with the aid of light and air during the short months of summer, and artificial light and heat during the long period and shorter days of the winter months, the window tax has been the means of causing infinite mischief, and suffering which is not easily calculated. In no situation, however, have its effects been so manifest, so palpable, and so directly injurious as in the cholera epidemic of Tooting Pauper Asylum. There it lent its powerful aid in contracting the dimensions of the apartments used either during the day, or as dormitories in the night, in diminishing the proportion of light and fresh air, and in rendering the persons of the occupants sickly, feeble, and unhealthy, like plants growing in cellars and vaults, or in the damp, cheerless atmosphere of the coal-mine. For all this evil, who should be made responsible?—the proprietor of the establishment or those who, by tempting him to have recourse to contrivances, which might prevent that establishment from being a source of loss, have led him to overlook the pernicious effects of these contrivances, in supposed advantage to himself? Justice requires that all these circumstances be taken into account in forming a correct conclusion.

From all the facts which have been hitherto elicited, it results, that the great error and chief cause of the subsequent evils was allowing so many persons to be congregated within one establishment, under the superintendence of one individual. With nearly 1400 persons, all young and many of those of tender years, assembled within one institution, and the necessary staff of teachers, servants, and attendants, it is impossible to understand, how one individual could perform the duties of superintendence, and see that every condition relating to food, clothing, education, and moral management, was accomplished in a satisfactory manner. It is no violent conclusion to assert, that these duties neither could be performed, nor in this instance were performed, by one individual, in such a manner as to justify public confidence, that they were adequately performed. In all probability, if the system of farming pauper children and boarding them in country situations be continued, care should be taken, that not more than 500 persons, certainly not exceeding 600, should be placed in one establishment and under the care of one person. With such a number, there may be reason to believe that the health, education, comfort, and moral training of the children might be adequately provided for, under the eye of a vigilant and conscientious superintendent. With greater numbers there is no security that either of these ends can be attained. It is likely, nevertheless, that public opinion has by this time pronounced its judgment on the practice, and that it must be doomed to that termination which probably it deserves.

ART. V.—*Observations on various points connected with the Physiology of Vision; on the Luminous Spectra excited by Pressure on the Retina, and their application to the Diagnosis of the Affections of the Retina and its Appendages.* By AUGUSTUS WALLER, M. D., Kensington.

LUMINOUS appearances, such as in ordinary circumstances we find produced by the agency of rays of light, are occasioned by pressure upon certain parts of the eyelids, and which are more vivid when in a darkened room. These luminous appearances are caused whenever the retina is irritated or acted upon by any mechanical agent, and are produced in a variety of circumstances which I shall enumerate. Their proximate cause is so far understood by physiologists, that the various sensorial nerves and their peripheric extremities are generally admitted to be agents adapted and predisposed to a certain action of a character peculiar to each.

In the instance of the organ of vision, which we have now to examine, the retina is particularly disposed to be excited by the rays of light, and by the images they form in certain conditions. But although the sensorial nerves manifest a peculiar predisposition to be stimulated by one single physical agent in preference to all others, various other agents exist, which, when applied with sufficient force, are capable of stimulating these nerves. Thus, independently of the rays of light, we may use the electric current or shock, simple mechanical action, probably caloric and some other agents, to stimulate the optic nerve. If, in place of this nerve, we substitute those belonging to other senses, each of them will be found to be excited by these various causes. The manner in which they obey the action of the stimuli is peculiar to each; for instance, in the organ of hearing there is the sensation of sound, in the tongue that of taste. The organ of touch, and the skin in general, serve the double purpose of conveying the sensations arising from mechanical contact and the temperature of bodies; and, accordingly, the irritation of a cutaneous nerve gives rise to a feeling of pricking or of pins and needles entering the parts to which it is distributed, as it is generally termed, and also of tingling, and even of a sharp degree of heat, &c. The appearance of light in the eye is but a consequence of this law, and is created whenever from any cause the retina and its appendages are excited.

Although the fact of the occurrence of light in these conditions must necessarily have been known to observers from time immemorial, we do not find it mentioned by any of the ancient authors. It is probable that the curious theory of vision proposed by Democritus, who supposed that the eye perceived objects by emitting instead of receiving rays of light, was founded upon the luminous appearances which take place in the dark under the influence of pressure on the eye, or upon receiving a blow on the head. The apparent projection of these images in the field of vision, explains, in some degree, the idea of the eye emitting rays of light. Aristotle, in exposing the fallacy of this theory, does not allude to light produced in the eye by pressure or by any mechanical means, although he mentions the spectra that are produced in the eye after looking at the sun or at any bright object. Sir Isaac Newton is the first who appears to have paid any attention to these phenomena, and to have referred them to their true cause. He says, "Si quis in loco tenebricoso alterutrum oculi sui angulum digito comprimat, oculumque interea in partem contrariam avertat; videbit is circulum coloribus variegatum unum similibus, qui in pluma caudæ pavoniæ conspiciuntur; colores isti intra minutum secundarium evanescent, digiti autem pressûs frequentamento, identidem apparebunt. Annon hi colores oriuntur ex similibus motibus; excitatur jam digiti pressu ac motu in fundo oculi, ac alias lumine ibi excitari solent ad sensum videndi movendum. Et annon hi motus semel excitati, permanent circiter minutum unum secundarium ante quam essent?"*

These phenomena have more recently attracted the attention of philosophers, more especially that of Sir David Brewster, Purkinje, and others. Brewster, in giving an account of these appearances (Natural Magic, page 18), says:—"In the numerous observations which I have made on these luminous circles, I have never been able to observe any colour but white, with the exception of a general red tinge, which is seen when the eyelids are closed, and which is produced by the light which passes through them. The luminous circles, too, always continue while the pressure is applied, and they may be produced as readily after the eye has been long in darkness; and when in this state light is allowed to fall upon it, the part compressed is more sensible to light than any other part, and consequently appears more luminous. If we increase the pressure, the eye-ball, being filled with incompressible fluids, will protrude all round the point of pressure, and consequently, the retina at the protruded part will be compressed by the outward pressure of the contained fluid, while the retina on each side, namely, under the point of pressure and beyond the protruded part, will be drawn towards the protruded part, or dilated. Hence, the part under the finger which was originally compressed is now dilated, the adjacent parts compressed, and the more remote parts immediately without this dilated also. Now, we have observed, that when the eye is, under these circumstances, exposed to light, there is a bright luminous circle shading off externally and internally into total darkness. We are led, therefore, to the important conclusions, that when the retina is compressed in total darkness, it gives out light; that when it is compressed when exposed to light, its sensibility to light is increased; and that when it is dilated under exposure to light, it becomes absolutely blind, or insensible to all luminous impressions."

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* See Optics, Book 3d.

The above observations comprise all the principal facts related by former observers that I have been able to collect. I will now proceed to state the results which I have myself obtained from a careful examination of this phenomenon on myself, and upon numerous other persons where I have examined it. If we consider, in the first place, the causes which are capable of giving rise to luminous appearances in the eyes, we shall find them very numerous, and, in some instances, capable of combining together and of modifying, in various ways, the form of the luminous spectra themselves. Although these causes may all be referred to one primary cause, namely, a mechanical disturbance in the molecular state of the retina and its appendages, yet, as the spectral appearances vary according to the mode in which this disturbance is created, I consider it desirable to specify the principal of them *seriatim*. These are, 1*st*, Temporary pressure on certain parts of the eyeball; 2*d*, Sudden rotation of the eyes; 3*d*, Sudden rotation of the head; 4*th*, The effort of straining, 5*th*, Continued pressure of the brain when divested of the cranium; 6*th*, Compression on the head; 7*th*, Voltaic and tension electricity; 8*th*, The various pathological conditions of the retina, optic nerve, and brain, whether idiopathic or sympathetic in their origin. Of the latter, affections of the stomach are most frequent, probably by their influencing the circulation in the brain.

My intention at present is to examine the ocular appearances belonging to the four first causes.

Temporary pressure.—By introducing the finger as far back as possible between the orbit and the eyeball, luminous appearances may be excited by pressure on any point of the eye, the eye at the same time being moved so as to expose its posterior parts as much as possible. We are aware that the retina exists immediately beneath at the upper part of the eye, where the organ is most exposed; the circumference of the crystalline lens may be distinguished by the degree of resistance which it offers to the fingers; accordingly, the sensation of light only commences when pressure is applied behind the lens. The brightness of the light produced is found to differ at the various points of the circumference of the eyeball. The brightest appearance is caused by pressure at the upper segment. At the lower segment the spectra are more difficult to obtain, and are less bright. At the external and inner angles of the eye, the spectra are generally more faint than at either the upper or lower regions of the eyeball. At the upper segment, the luminous appearance is larger than those created at any other part.

The spectra of the upper and lower segments generally consist of several concentric rings, alternately dark and bright. Those of the external and internal segments sometimes offer one or two concentric bright and dark rings, but generally only one bright ring can be seen, limiting a dark circular area. I have never been able, any more than Sir D. Brewster and other observers, to detect the variegated or irisate colours mentioned by Newton, neither on myself nor in the numerous cases where I have applied compression.

The spectra appear more vivid in the dark than by daylight, and on a bright day they can scarcely be detected. A prolonged inactivity of the eyes, such as remaining in darkness for some time, further increases the brightness of the appearances. I have particularly observed in rooms darkened for the diorama or for the gas microscope, that the ocular spectra are less bright upon first entering the chamber, and that they become more bright afterwards. It is a well-known fact, that on these occasions the sensitiveness of the eye, at first obtuse, becomes very acute after remaining in the dark a short time. I find that the acuteness of vision and the brightness of the spectra both coincide, and are affected in the same manner and at the same time. The best time for making these observations is on a bright sun-shiny day. On entering the darkened room, the objects are at first unperceived. The ocular spectra are likewise very faintly seen. After a few minutes, when the eye is more sensitive, the ocular spectrum is also more vivid.

I think it almost impossible to make any correct measurement of the diameter of these spectra; but in cases where I endeavoured to determine the diameter of that excited on the external angle of the eye, I found that at the distance of about three feet the circle covered an area of three quarters of a foot in diameter.

These images always appear at a point diametrically opposite to the point compressed. Thus, pressure on the external angle causes a light apparently near the inner part of the eye, and *vice versa*. With pressure at the inner angle and upper segment, a light is seen towards the lower part of the eye, and an upper light is created by pressure at the lower segment. As the irritation is moved higher or lower, the image descends or ascends; when it is advanced and receded on the surface of the eye-ball, the image likewise recedes and advances in a contrary direction. From the manner in which the eye-ball is protected, it is impossible to irritate the posterior parts so as to create an image near the centre of the field of vision, but there is no reason to doubt that the irritation of each point would be projected outwards in a determinate direction in the same manner as those points which are accessible. An ingenious instrument for drawing the resemblance of solid objects, and more especially the profile of individuals, called the physionoscope, forms its images in a very similar manner to those above described. It consists of a short rod revolving on a centre placed near one of its extremities. The point of revolution corresponds to the point of decussation in the eye, described by Volkmann, which is situated behind the lens. If the extremity of the short lever be supposed to correspond to any point of the retina stimulated by external contact, the other extremity of the lever will be found to correspond with the point where the image appears to be projected. If the pressure is applied over the eyeball as far back as possible when the eyes are open, the spectrum may be projected for a short time in the field of vision. A gentle light just sufficient to distinguish surrounding objects distinctly will be found best for this purpose. The image then appears to consist of a bright ring, enclosing a circular area completely black. The ring is very narrow and well-defined. A curious effect is produced by the images of external objects falling on the retina while in a state of compression, showing that compression is not sufficient to paralyse it, the circular spectrum being seen simultaneously with other objects, which appear as if viewed through it.

Sir D. Brewster states that these luminous circles continue as long as pressure is applied, but I find that such is not the case in my own experience, their duration in the dark being the same as that given by Sir Isaac Newton, *i. e.*, about the space of a second. When, as above stated, the spectrum is produced in the field of vision in the light, it remains visible longer; but if the pressure is long continued, the field of vision becomes dim, with irregular images, such as continued pressure always produces. In the dark, the continuance of the images can only be obtained by moving the finger up and down. I have found the same to be the case in patients I have examined. The impossibility of causing persistent images is one of the difficulties attached to this mode of examination, and can only be surmounted by keeping up a kind of quivering movement of the fingers.

It has been stated by Muller, that, by means of the luminous spectra excited by pressure, we may demonstrate the simultaneous action of the homologous points of the two retina, viz. by pressing upon the upper segment of the two eyes, one spectrum is produced, and the same with regard to other points of the retina which are known to act together. I find that these observations are perfectly correct, although, to produce them, they require some care and habit of applying pressure to the eye.

Spectra produced by sudden lateral movement of the eyes.—In the dark, sudden lateral movement of the eyes gives rise to two bright circular rings enclosing a dark area. They are equally bright in both eyes, and appear nearly in the centre of the field of vision. When the same movement of the eyes is made in open day, with the lids shut, I perceive two circles differing slightly from each other. That on the left, which is my best eye, is a circle of faint light, brighter at the circumference, and becoming gradually more dim towards the centre. The exterior of the circle and field of vision is of a dull red, caused by the semitransparence of the eyelids. The circle on the right is bright at the borders, and of a dark bluish colour within; a moment after, the forced action of the muscles, which is the cause of this, ceases, the blue tint gradually clears off, and as if underneath is the dull red circle, such as I always witness with the left eye. Respecting the different degrees of the strength of my eyes, I find, that although I see equally well with both, the right soonest becomes fatigued, and I generally depend upon the left in microscopic examination.

When the appearances above mentioned as following sudden lateral movement of the eyes are produced, I find that, by shaking the head round from right to left, the circle becomes decomposed into several concentric rings alternately bright or dark, or into radiating spokes, alternately bright and dark. Generally neither the concentric rings nor the radii are all seen at once so regularly as in the two figures I have given. I am able to distinguish them most plainly with the left eye.

Spectra produced by the action of straining.—In performing this action in the dark, the luminous spectra have generally appeared to me to consist of minute points or curves all round the orbit. These points probably correspond to the ciliary arteries at the point of entrance through the sclerotic.

Application of the spectra produced by pressure as a means of diagnosis of the condition of the retina.

In consequence of the intimate relation which I had detected between the brightness of the spectra produced by pressure, and the sensibility of the retina to the rays of light, I was led to conclude that the same process might be applied with great advantage as a means of detecting the condition of the nervous parts of the visual organ by direct experiment. In practice it is well known to be frequently a most difficult point to decide whether the impairment of the eye-sight arises from some defect in the physical parts which the rays have to traverse previous to their attaining the retina, such as the cornea, iris, lens, or the liquid humours, or whether both are affected simultaneously. At present the only guides enabling us to localize the affections of the nervous parts of the eye are of a negative nature, for it is very rare that any material alteration can be detected in the retina or optic nerve. Thus, if, after having examined all the anterior parts of the eye, if, after having dilated the pupil, no visible obstacle to the rays of light is perceived, we are generally induced to attribute the symptoms to a morbid state of the nervous parts. Nevertheless, this question is not one of merely scientific curiosity, for upon the diagnosis of the retina depends whether the surgeon is to operate or not. I will now mention a few of the cases I have collected to elucidate this question:—

Case 1. M. R—— eleven years ago lost the sight of her left eye, and about twelve months after that of her right. At present is not able to distinguish light from darkness, and the strongest light is not in the least degree perceptible. The eyeballs retain their natural size but the sclerotic and cornea present extensive signs of inflammation, the latter having become very opake. The iris on each side is very indistinct and deformed. The right eye bears marks of having been operated on for cataract, which was performed in one of the hospitals without conferring any benefit. Compression around the eye was used repeatedly with great care, but without exciting on either side the least sensation of light. Pressure on the right side caused considerable pain, which was not the case with the other eye.

Case 2. E. H., aged 14, is affected with weak eye sight, and often perceives various *muscae volitantes.* The pupils contract slowly and imperfectly; that of the left eye is less active and contractile than the other. In this case compression detected the condition of the retina with great accuracy; for, although a bright circle was seen in both eyes, that on the right side was much more bright than on the left. In various cases of the same kind when there was a want of nervous power in the retina, I have been able to ascertain the state of the nerve, without any examination of the organ, by simply testing the condition of the retina in a dark room.

Case 3. —— Smith, has frequently suffered from inflammation of the eyes. Within the last few months he sees frequently in the field of vision small objects which he compares to flies. On examining the eyes on both sides, it was found that the sight of the right eye was much more confused and imperfect than that of the left, of which fact he was previously unconscious. In all other respects the eyes appeared quite alike, and the pupils were equally contractile. Pressure over the retina gave rise to luminous appearances in both eyes, but on the right side he ascribed the light as being less vivid than on the left.

Case 4. Mrs P——, eye-sight very imperfect. On the left side is a cataract which prevents her from distinguishing the form of objects however bright, although she is able to distinguish light from darkness. On the other side is another cataract, but less advanced, the vision much more distinct, although more imperfect than natural. Compression of the eye-balls causes two bright circles equally brilliant on both sides. This patient intends to be operated upon for cataract, when I shall have still farther occasion to ascertain how far the sensibility of the retina to pressure coincides with its sensibility to light.

Case 5. Elizabeth E——, has paralysis of the right arm. Vision on the right side more dim and imperfect than on the left. Pressure of the eye caused a bright circle on the left, but nothing on the right side.

Case 6. Madame P—— had a sudden attack of hemiplegia, which lasted for several days, after which sensation and muscular power were entirely recovered. At the commencement of the attack the eye-sight on the left side was much impaired, while that on the opposite side remained as usual. At this period compression of the retina caused a luminous circle much more vivid than on the right. The eye-sight afterwards recovered its former vigour simultaneously with the recovery of the muscular power and sensibility of the limb. Retinian pressure after recovery was found to create equally bright circles in both eyes.

ART. VI.—*On the Antagonism of Miasmatic Fever and Pulmonary Consumption, and the alleged incompatibility of Ague or its Causes with Pulmonary Consumption.* By M. Boudin, Horace Green, M. D., and Dr Helfft.

FOR nearly fifty years an idea has been more or less strongly entertained by many members of the profession, that pulmonary consumption is a disease either uncommon or not known in miasmatic districts, productive of malaria and intermittent and remittent fever. It is not very easy to trace the original source of this notion, as at first it merely appeared in the form of the observation, that pulmonary consumption, which was so common in other parts of the island, was not much observed in certain fenny districts.

Bang, a physician of considerable note at Copenhagen, and who published, in 1789, Clinical Reports of the Hospital Practice there, records the fact, that a person labouring under symptoms of pulmonary consumption, was attacked by quotidian ague, and thus got rid of his pulmonary disorder.

This case, Frederic Ludovic Bang gives in a manner very brief, and perhaps too vague to demand much confidence either in a diagnostic or therapeutic point of view. “The incipient stage of phthisis,” he states, “indicated by cough, mucous expectoration, wandering pain in the chest, breathlessness, loss of appetite, wasting of the person and strength, and hoarseness, with which a man aged 40 years was for six months afflicted, all happily disappeared upon the approach of a quotidian fever, which, after seven accessions, was cured by the exhibition of bark.”[*]

Marx, also, in a treatise on pulmonary consumption, published in 1784, states, that persons labouring under that disease have, in some instances, recovered from it, in consequence of being attacked by ague.

The first person who appears in this country to have given the doctrine a formal substance, was Dr Harrison of Horncastle, in Lincolnshire, who, in 1802, made known his views on the subject. He states, in a discourse delivered before the Medical Society of that town, that he had not resided long in that division of Lincolnshire, before he was strongly impressed with the idea, that the inhabitants upon the Wolds, or elevated district of that county, were a great deal exposed to idiopathic consumption, and peculiarly liable to calculous complaints; while in the division of Holland, one of the lowest and most fenny parts, and the extensive marshes of the county, these disorders are probably less known than in most other situations in England.

He next states, that he does not wish to be understood to assert that phthisical complaints of all kinds are more prevalent upon the Wolds. His observations were directed chiefly to affections which originate in scrofula, and these he was inclined to believe were much less frequent in the division of Holland than in that of Lindesey. The situation of Horncastle had afforded him, during a space of more than fourteen years, numerous opportunities of investigating more particularly the prevalence and origin of pulmonary complaints, and he had arrived at the conclusion, that these were much less frequent in the fens and marshes than in other parts of his circuit. The difference with respect to idiopathic consumption, he represents to be very great indeed. In some parts to which his professional engagements called him, it was a very common complaint; in others, it was scarcely known to the faculty. Pulmonary consumptions, he allows to be met with everywhere; but when he was consulted upon cases of this nature within the circuit of the marshes, or in the division of Holland, he could trace them either to other situations, to neglected colds, or to some irregularity in the suffering person.

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[*] “Phthiseos initia cum tussi, sputo mucoso, dolore vago pectoris, dyspnœa, anorexia, consumptione corporis et virium, raucedine, quibus quadragenarius dimidio anno afflictus fuit, feliciter evanuerunt sub accedente febre quotidiana, post septem vices per corticem sanata.” Selecta Diarii Nosocomii Fredericiani pro Ann. 1781. Auctore Frederico Ludovico Bang, M.D. &c. Apud Acta Regiae Societatis Med. Havniensis, vol. i. Havniæ, 1783. p. 15.

Jak. Marx Abhandlung von der Schwindsucht und Lungensucht, und der Mitteln wider dieselben. Hannov. 1784. 8vo.

Excluding consumptive disorders occasioned by accidents, to which all persons are exposed in the usual business of life, Dr Harrison refers chiefly to what he calls florid consumption and tubercular consumption.

When Dr Harrison first adopted the opinion, that pulmonary consumptions were seldom produced in the division of Holland, he applied for further information, among others, to Mr Wayet, an old and experienced practitioner at Boston. This gentleman informed him, that pulmonary complaints of all kinds were very uncommon in that neighbourhood, and that those which did occur were milder than in other places. In an extensive practice of more than forty years, he had seldom attended in cases of peripneumony or spasmodic asthma, and measles were seldom dangerous in that part of the country. From another gentleman, also, who had some knowledge of the United Provinces of Holland, he learned that consumptive disorders seldom occurred among the Dutch. This alleged exemption from phthisical complaints, he ascribed to the same physical circumstances in both countries. In the lower parts of Lincolnshire, he observes, the air is moist and soft, when compared with the atmosphere upon the Wolds. The lungs are therefore less irritated by it, and, in consequence, he concludes, tubercles, which lay the foundation of idiopathic consumption in other places, are seldom met with in these situations.

Sheep, it is well known, are liable to be affected with tubercles in the lungs, and to die hectic. By what morbid action tubercles are formed in these animals, and whether they remain indolent for some time, or are roused into immediate action, are subjects upon which no satisfactory information can be given. In human lungs, the suppurative process is often very slow. Unless the lungs be hurried into suppuration by mismanagement or irregularities, they remain stationary for several years, and under favourable circumstances, appear to be gradually absorbed. In every case, where the existence of tubercles is suspected, he recommends the patient to remove into a soft moist atmosphere, where the lungs will be less stimulated; and to remain in it till he has reason to believe, that the tubercles are entirely removed. Whether more eligible places are to be found in other parts of the kingdom, he does not determine; but till we have obtained better information upon the subject, he is disposed to recommend a residence in the Lincolnshire fens to such patients, in preference to every situation with which he is acquainted.

By making experiments upon sheep in different districts, situations, and circumstances, he believes that some comparative knowledge would be obtained, which might assist our inquiries into the prevention and cure of tubercular consumptions in the human body. If, for example, a flock of sheep were to be bred, and wholly maintained upon the Wolds till they were fit for the butcher, and another were to be kept in the fens, an opportunity would be given to examine the lungs in each, and to determine how far the different flocks were affected by their respective pasturage. Such an inquiry would probably enable us to treat the diseases of sheep with more success, and thus a double benefit be conferred upon society by the investigation.

1. In January, 1793, a young lady, aged about twenty, who had been a patient under Dr Harrison for several months, with very strong symptoms of florid consumption, went upon a visit into the neighbourhood of Wisbeach, in the Isle of Ely. While under the care of Dr Harrison, she had continual pains in the chest, with short dry cough, the sputum being generally streaked with blood. Motion soon fatigued her, and increased the dyspnœa and cough; she evidently lost flesh and strength, and in an afternoon and evening she had a slight hectic fit. Her being of a consumptive family, he considered as affording a prognostic unfavourable to her recovery. After an absence of three months, she returned again so much improved in health, that she thought herself quite well. She took up her residence at an elevated village in this neighbourhood. Dr H. frequently saw her, and had the mortification to observe an insidious attack of all her old symptoms. Before the end of the summer, he thought her as bad as ever she had been, and urged her to return to her friends near Wisbeach. With this advice she neglected to comply for two years, during which time her symptoms rather increased than abated. After a second visit of near four months, in the winter and spring 1795, she returned again to her relations, where she continued several years without suffering much from phthisical complaints, though her constitution remained infirm, and her complexion was pale and sallow. About two years previous to the date of these observations, she married, and resided in a distant county, where she enjoyed better health, and became a mother.

2. He mentions also the instance of the wife of an apothecary, who was several times rescued from impending consumption, by removing from Lynn Regis to Wisbeach. Her relief was so striking and immediate, that before she had travelled three miles, she always found herself better, and in a few days her pectoral disorder entirely left her. Sensible of the great benefit she received from this particular change of air, she had recourse to it whenever attacked by her phthisical symptoms.*

It thus appears that Dr Harrison had not only maintained the doctrine that tubercular consumption is an uncommon disease in fenny districts, but he had founded on this doctrine the therapeutic proposition, that tubercular consumption might in certain stages be cured, by causing the patient to reside in a low and fenny district. Whether this doctrine and the correspondent therapeutic maxim received much attention from physicians, does not at that time appear. The doctrine, however, was destined to be more fully and extensively brought under the notice of the profession by a writer of acknowledged talent and great acuteness.

In 1811 Dr Wells read to the Medical and Chirurgical Society of London, a Memoir containing Observations on Pulmonary Consumption and Intermittent Fever, chiefly as Diseases opposed to each other, with an Attempt to arrange several other Diseases, according to the Alliance or Opposition which exists between them, and one or other of the two former.

The initial idea of this inquiry Dr Wells had imbibed at an early period; as he states that he was informed in Holland, in 1779, by an old Scottish officer of the Scottish Brigade, in the service of the Seven United Provinces, that while in garrison in Flanders, he had often seen consumptive persons come for the benefit of their health, from the high and dry parts of the country to those which were low and marshy, and infested with agues. The reflections, which Dr Wells made on this practice, led him to inquire, whether countries in general, which are more subject to intermittent and remittent fevers, abound less in pulmonary consumption than others, which are free or nearly free from those distempers, yet enjoy the same or nearly the same temperature of air; and whether the same country, which had previously been productive of agues, becomes, after these fevers have ceased, or have been less frequent and less violent, more productive of consumptive disorders.

London, he observes, underwent in the course of the 18th century two remarkable changes in relation to its diseases. Soon after the beginning of the 18th century, the deaths from consumption, according to the bills of mortality, constituted only one-eighth of the whole number, but formed towards the end of the century one-fourth. In the former part of the same century, intermittents were very frequent in London, but in the last part, they were so rarely, if ever contracted in the city, that whenever he attempted to trace the origin of those instances of the disease which he saw, he could always free it in places more or less remote from the capital. This circumstance he considers to form a strong presumption, that the changes in the comparative frequency of these two diseases were in some degree connected.

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* An Address lately delivered to the Medical Society of Horncastle in Lincolnshire, on Endemic Causes of Disease. By C. Harrison, M.D. London Medical and Physical Journal, vol. viii., p. 221. London, 1802.

In making this general inference, Dr Wells allows for various sources of fallacy; the deaths being stated as both consumption and tissick, especially for a considerable time; many deaths being by the searchers set down to consumption, which might have proceeded from other causes; the junior population of London being composed not only of persons born within the city parishes and their liberties, but of young persons incessantly arriving from the provinces, and consequently furnishing a larger proportion than in other places of persons likely to be attacked by consumption and pulmonary diseases;—and similar causes. Upon the whole, Dr Wells thinks it a just inference, that the mortality in London from consumption must, at the time when he wrote, be greater than in proportion to any supposed or real innate disposition to produce that disease; and that, conversely, those places from which proceed many young persons, may appear less apt to give rise to consumption than in reality they are.

Dr Marshall of Lynn, in Norfolk, a place surrounded by fenny ground on the land side, stated in reply to a query proposed to him about 1800, that the place he believed came within the description of Dr Wells: "The intermittent fever," he adds, "wherever it prevails, will bear no brother near the throne."

Mr R. Weekes of Hurstperpoint in Sussex, an experienced practitioner, informed Dr Wells, in 1807, that the lands in his neighbourhood had of late been much more effectively drained than formerly; that intermittents had since become much less frequent; and that in the same interval, pulmonary consumption had become, in his opinion, more frequent. The last mentioned change he was disposed to attribute to the circumstance of the food of the common people being less nutritious than it used to be; but this explanation Dr Wells thinks does not account for the fact.

In referring to the facts mentioned by Dr Harrison, already noticed, Dr Wells states that he was informed by a clergyman, a native of Lincolnshire, and who resides there, that he had known several instances of consumptive persons being sent to the fens for the recovery of their health. Similar accounts he had received of the comparative rareness of pulmonary consumption in the marshy districts of Kent and Essex; but in a form not sufficiently authentic to entitle them to attention.

He also adduces from the history of agricultural improvement in Berwickshire, Perthshire, and Clackmannanshire in Scotland, instances and facts to show, that as ague had become less frequent in these counties, consumption had become more prevalent.

The Reverend Mr Leslie informed Dr Beddoes, that whenever the students at the English Academy, in the neighbourhood of Liege, became affected with consumption, they were sent to low, foggy, and swampy places in Austrian Flanders, where in the course of a few months, it is stated, they almost always recovered their health; but that, if they returned to the Academy, they fell again into that disease. Dr Wells thinks, from the account of the symptoms presented by these young persons as given by Mr Leslie, that it is clear, that he was not mistaken as to the nature of the disease, and that it was really pulmonary consumption.

Brussels, he next observes, in the province of Brabant, is represented by Sir John Pringle as being high, well-aired, and healthy; that is, exempt from intermittents and other autumnal diseases to which the army was subject in the Netherlands. In the Acts of the Society of Medicine of that city, published in 1801 and 1802, pulmonary consumption is stated to be one of the most common diseases there.

This statement regarding Brussels, nevertheless, requires some qualification. It is quite true that one part of Brussels is built on elevated ground, and may be dry and exempt from the distempers of wet marshy localities. But a considerable part of this city stands in a depressed, flat, situation, and is traversed by the Senne, a slowly-moving stagnant stream, which cannot fail to communicate its moisture to the neighbouring streets and lanes. Not only is this, the north-western division of the city, traversed by the Senne, but that stream sends off various canals, which cannot but add to the general humidity of the soil and atmosphere. At the north-west corner of the city, also, is a considerable canal,—the canal of Brussels and Antwerp,—communicating, within the walls, with a considerable basin, and without, with the Charleroi Canal, immediately without the bulwarks; while beyond this, again, is a smaller, but equally lengthened canal, which traverses from south-west to north-east the district of Molenbeek St Jean.

Even beyond the most elevated parts of the city in the districts of St Josse-ten Noode and Ixelles, are distinct evidences of the marshy and depressed character of the country. In each of these districts is a considerable pool of stagnant water, the remains, unquestionably, of more extensive marshes or lakes. In truth, to any one surveying with a practised eye this part of the suburbs of Brussels,—for these pools are beyond the walls, — it would most readily occur, that either two considerable lakes with marshy banks must at no remote period have existed, or that an extensive lake with marshy pools at its margin must have covered the greater part of these two suburbs. The whole surrounding country, also, especially in the west and south, is low, flat, and level.

As early even as 1791, F. E. G. Hirschings, a writer on medical topography, had given account of the physical and meteorological peculiarities of Brussels, contradicting, in almost every point, the statements of Sir John Pringle. "The city of Brussels," he says, "lies in a valley, in a somewhat marshy district. The whole year round it is infested with mist. Much rain falls, at least twice in the week. The air is always cold and moist; it has few open places or squares; and is so surrounded by walls, that the ventilating operation of the winds is obstructed. The best parts of the town are the wide streets. The town lies close to a small river. There are few or no springs of water; hence the inhabitants are commonly compelled to collect rain water in cisterns for ordinary uses. The inhabitants drink much beer, which is thick, mucilaginous, and badly fermented. They drink also great quantities of weak tea and still weaker coffee. Wine is too costly to be in common use. The principal articles of food are oysters, fish, cheese, butter, and a considerable amount of farinaceous substances, with very oleaginous sauces. Most of the people," he adds, "take little exercise. From all the sources now mentioned arise frequent catarrhs; rheumatic disorders; ophthalmic diseases; inflammations of the throat; attacks of deafness, and similar disorders. In consequence of the sort of diet, many are attacked by mucous diseases, worms, biliary and strumous disorders. Fevers are usually of the bilious character, and rarely became putrid."*

The main point is this, that Brussels was at the time at which Dr Wells wrote, and is at present, still liable to ague and remittent fever, and cognate disorders, among its inhabitants, especially those resident near the banks of the Senne and the canals in general. How Sir John Pringle could have given it the character of a place "high, well-aired, and healthy," it is not easy to understand, unless he had either never visited it, or never examined its position with any attention.

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* F.E.G. Hirschings Allgemeine Archiv fur die Lander und Volkeskinde, 2 B. Leipzig, 1791; apud Finke Versuch Einer Allgemeinen medicinisch-praktischen Geographie. Zweyte Band, Leipzig, 1792, Seite 303.

The population of Brussels was in 1843 as follows:—

The City of Brussels, . . .	114,582
The Suburbs of Anderlecht, . .	5,271
Ixelles, . . .	9,659
Molenbeek St Jean, .	9,470
St Giles, . .	2,946
St Josse-Ten-Noode, .	12,913
	154,841

The total annual mortality of Brussels alone is about 3676, or 1 in 30·4.

As to the prevalence and fatality of different diseases, medical testimony is variable. One intelligent young physician informed us some years ago, that miasma is most prevalent, and produces almost incessant bad effects in the health of residents. In 1842, a typhoid remittent raged in the garrison, and destroyed many soldiers. On the other hand, Schonlein makes the following statement regarding Brussels. "At a trifling distance from Holland, in the sandy part of the Netherlands, scarcely elevated 80 feet above the level of the sea, for instance in the neighbourhood of Brussels, where intermittent fevers are rare, there tubercular consumption reigns continually."*

Dr Wells next adverts to the comparative prevalence of agues and consumptive disorders in Berlin, Vienna, St Petersburg, one or two places in Portugal, and a few in Italy; then surveys the information furnished by Egypt, Aleppo, Bengal, and various parts of the United States. The information, however, from these places, is neither so recent nor so accurate as to entitle it to much attention.

The only points deserving notice are some statements regarding the comparative prevalence of miasmatic fevers and consumption in various parts of North America.

Dr Walsh, in an account of the diseases of Canada, represents intermittents to be very frequent in the upper part of the country, particularly on the borders of the lakes. He makes no mention of pulmonary consumption, though he speaks of pleurisy. This evidence must be regarded as merely negative.

New Hampshire, on the eastern coast of America, occupies nearly the same degrees of latitude as Upper Canada, but from its being less elevated, perhaps also for other reasons, it enjoys a milder temperature of atmosphere. In Portsmouth, its capital, according to accounts published by Dr Spalding, a physician there, nearly one-fifth of the deaths are produced by pulmonary consumption. Dr Spalding speaks of diseases only as causes of death; no precise notion, therefore, can be obtained from what he has published, whether ague is frequent or not, but he thinks it may be concluded that it is not frequent, as only two deaths from it occur in the course of eight years.

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* Allgemeine und Spezielle Pathologie und Therapie, B. III. sec. 74.

Rhode Island is so free from intermittents, that the rich inhabitants of South Carolina frequently go thither, in the summer, in order to avoid the diseases of their own state. Dr Wells was informed by an American gentleman who had resided both in Rhode Island and in this country, that consumption appeared to him to be there even more frequent than it is in Great Britain.

The deaths from consumption in the first eight months of 1807 are said to have been at New York one-fifth, and at Philadelphia, during the same time, one-sixth of the whole numbers which occurred at those places.* As Philadelphia is not a degree further south than New York, the difference between them, with respect the production of consumption, cannot, he thinks, be attributed to difference of temperature, but must, he infers, be imputed to the difference in the frequency of intermittents which is known to exist.

In the Azores, in which the climate is represented to be the most equable in the world, Mr Graham, the English consul, informed Dr Currie of Liverpool that consumption was a prevalent disease. Was this prevalenee among natives or visitors?

Dr Wells states, from personal knowledge, that in South Carolina consumption is rare and intermittents are exceedingly frequent. He refers particularly to what is known of the white inhabitants; for negroes are affected very differently, he maintains, from the white race by causes of disease. Negroes, he adds, if moderately well fed and properly treated in other respects, retain their health, though labouring daily in rice swamps, where their masters would almost infallibly perish; but, on the other hand, they contract dangerous inflammatory diseases in circumstances which prove harmless to whites.

Negroes, it may be added, are in this country quite as liable to consumption as whites; and the mulatto or mixed races are rather more liable, if possible.

Bermuda, which lies in the same latitude as South Carolina, possesses a much more temperate atmosphere, being neither so hot in summer nor so cold in winter. This equality is evidently owing to its insular situation. It is, Dr Wells states, very free from intermittents. But consumption was, at or previous to the time at which he wrote, much more frequent in it than in South Carolina.

Madeira, which lies in the same latitude with Bermuda, is also free from intermittents. Dr Wells states, though doubtfully, as the authority on which the statement is made, was questionable, that pulmonary consumption may frequently originate in that island.

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* Edinburgh Medical and Surgical Journal, Vol. v.

The information as to Barbadoes and Jamaica is rather of an uncertain character.

The facts thus stated were sufficient to establish, in the opinion of Dr Wells, beyond doubt, the inference, that in some places where agues are prevalent, pulmonary consumption is comparatively rare; and that in others, while agues have diminished, consumption has become more frequent. These concurrences, he argues, are too numerous to allow us to suppose that they are merely accidental. He thinks, therefore, that it must be admitted as a general truth, that the frequency of intermittent fevers, in any country, renders the instances of pulmonary consumption in it less numerous than they would otherwise be. This truth, as he calls it, may, he allows, be obscured by various circumstances and modified by others.

Assuming that the arrangement thus stated is correct, he gives the following view of what may be called the final causes of the etiological relation between ague and consumption.

"Pulmonary consumption and intermittent fever are by far the most destructive of the diseases which are incident to man. It is agreeable, therefore, to the general rule which we see observed, with respect to the distribution of good and evil in the world, that these two immense causes of death should nowhere occur together in a high degree. That this is really the case is already, in great measure, established. For it has long been known, that pulmonary consumption is much more common in cold than in warm climates, but that intermittents never originate during the presence of frost, and are frequent and dangerous when the other circumstances are equal, which are requisite for their production, in proportion to the heat that prevails. It is surely then natural to infer, without the further knowledge of facts, that pulmonary consumption and intermittent fever are opposite diseases.

"If it be now asked, in what manner do intermittents lessen the frequency of consumption? my answer is, that their operation, probably here, is chiefly a consequence of the more general fact, that the existence of one disease in the human body, or even a tendency to one disease, often renders it less susceptible of another disease, than if it were free from all morbid impressions. It may be objected, however, to this explanation, that intermittents rarely affect a very great proportion of the inhabitants of any country, during even part of a year, and seldom remain with any of them a whole year or more, and consequently, that the cause assigned is inadequate to the production of the effect, which is supposed to flow from it. To this I reply, that the causes of no disease affect at once such large numbers of men, and at the same time make so lasting an impression upon the bodies of individuals, as those of ague. In maintenance of the first proposition, I shall mention, that the inhabitants of a country infested with ague, though they may be apparently in perfect health, are often, during the season of that disorder, attacked with it, almost immediately after fatigue, errors in diet, long exposure to the damps of night, or being wetted with rain, while similar circumstances, at the same season in the same country, produce no such effect upon strangers, during the first eight or ten days after their arrival. The former, therefore, must have previously had a disposition to ague, though demonstrated by no external signs; and if this unknown state be capable of being changed, by very slight circumstances, into an evident and great disease, it may readily be thought sufficient to resist the action of the causes of another disease. To prove the second proposition, I may say, that persons who have once contracted an ague, are sometimes subject to a return of it in the spring or autumn, or both, for several years, though living in countries where agues do not originate, and that agues often do not appear till the spring, though their causes were applied to the body in the preceding autumn. I have known three instances of this latter fact myself, and I have been informed, that similar instances frequently occurred in the spring of 1810, among the officers and soldiers of the British army, who had been in Zealand in the autumn of the year before. It seems, indeed, very probable, that the intermittents which occur in the spring, always arise from impressions which were made the preceding autumn, as I know, that in South Carolina, strangers visit the unhealthy parts of it with entire impunity, in the spring, though the inhabitants themselves are subject to vernal intermittents.

"Whether a person, affected only with a disposition to pulmonary consumption, is more capable than others of resisting the attacks of ague, I have not hitherto learned; but Dr Caldwell of Philadelphia has observed, that those who labour under the former disease are little liable to the latter. The consumptive individual, however, while he thus resists the full operation of the causes of ague, must yet be acted upon by them as other persons are, and this action, though not followed by its ordinary apparent effects, may be sufficient to impede, and ultimately to arrest, the progress of his disease."

Then, after a lengthened and ingenious comparative view of the antagonism or resisting operation of ague and various other diseases, as scrofula, continued fever, &c., he makes the practical and therapeutic application in the following manner.

"The influence of climate, in giving origin to consumption, is probably often exerted long before any symptom of the disease can be discovered. Thus, the only white adults whom I recollect to have seen attacked with consumption in South Carolina, were born in Britain, and went from it to the former country when young men, several years before the disease appeared; and though, as I formerly said, the natives of warm climates, when sent hither in childhood, are more apt to fall into that disease than ourselves, yet, if I can trust to the accuracy of my own observations on this point, for I have not seen it treated in books, such of them as remain at home till they have acquired their full growth, are afterwards less liable to become consumptive in this country than our own people of similar ages. When, therefore, parents have reason to dread from past experience, that their children are likely to prove consumptive, and are consequently eager to make every attempt in their power to avert this misfortune, they should be told, that measures of prevention, to have the best chance of success, ought to be very early adopted. Parents thus situated, might therefore be advised to send their children to school in the fenny districts of the counties of Lincoln or Cambridge; and, if their fortunes be small, to place them afterwards with persons living in the same or similar districts, for the purpose of being taught some art or profession. Youths of better condition might go from those districts to Leyden, to prosecute their studies there, or to counting-houses in Amsterdam or Rotterdam, if they be intended for merchandize. In this way might be passed, without any considerable sacrifice of time or money, or the omission of proper instruction, the period of their lives which is most exposed to receive impressions from climate favourable to the production of pulmonary consumption, that which intervenes between the ages of seven and twenty years. Afterwards, they who have followed the plan which has been pointed out, will probably be as secure against the attacks of that disease, as the generality of their countrymen.

"If consumption has actually come on, residence in a fenny country may still be recommended, if it has not been already tried without success, as a measure of prevention, since the testimony of Mr Leslie places beyond doubt, that this disease has been frequently removed by such means.

"Should it, however, be thought preferable to send a consumptive person to a warm climate, it ought to be remembered, that Lisbon, Nice, and Naples, have been held by English physicians who visited them, as places not the best adapted for the cure of this disease. When such a person, therefore, goes to Portugal, instead of residing in Lisbon, or on the neighbouring high ground, he should imitate the practice of the natives, and pass into the low and swampy country of Alentejo.

"Madeira, from the mildness of the winter there, must be a fitter place of residence for the consumptive during that season, than any part of this country; but, as it probably gives origin itself to many consumptions, its climate cannot be regarded as well adapted for the cure of those which have arisen in other places.

"A voyage to the West Indies and a residence there for several months, would afford consumptive persons a better prospect of recovery than any of the means which have been hitherto mentioned. Of the English possesions there, Jamaica and the newly-settled small islands, would be more likely to prove advantageous to them than Barbadoes, or any of the other islands which have been long cultivated, and have the reputation of being healthy.

"The danger, however, of contracting other diseases in the West Indies, will always deter many persons from going thither for the cure of consumption. The same danger does not exist, in an equal degree, in the hot climate of Egypt, since its chief disease, the plague, may be easily avoided. As this country, therefore, is represented as free from pulmonary consumption, the ancient practice of sending thither persons affected with that disease might be revived with considerable advantage to them. Its many wonderful relics of ancient art and magnificence, would also, by affording amusement and instruction to our well-educated young countrymen, tend to relieve that langour of mind of which they often complain, in those places to which they are now commonly sent on account of their health.

"In Egypt, indeed, as well as in other countries which have been mentioned, those who are sent to them for the prevention or cure of consumption will, no doubt, be liable to be attacked with intermittents. But, although the latter diseases, when very prevalent, are a greater national evil than pulmonary consumption ever is anywhere, both by causing, directly or remotely, the death of more persons, and by withholding, during life, a much greater quantity of labour from the service of the country, yet their injury to individuals is to be estimated very differently. For intermittents, in proportion to the number attacked by them, destroy but few, whereas consumption almost constantly proves fatal, if the persons affected with it remain where they contracted it. Little objection should therefore exist, on the part of the consumptive, to removing into a low and swampy country, were an attack of an ague, there even certain, and still less when it is considered, that those who labour under consumption are less readily seized with ague than the healthy, and that a mere disposition to the latter disease is, probably, often sufficient both to avert and to cure the former."*

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* Observations on Pulmonary Consumption and Intermittent Fever, chiefly as Diseases opposed to each other; with an attempt to arrange several other Diseases according to the Alliance or Opposition which exists between them, and one or other of the two former. By William Charles Wells, M.D., &c., read December 24, 1811. Medical and Chirurgical Transactions, Vol iii., Art. xxxii., p. 671. London, 1812.

It has been seen, that the evidence adduced by Dr Wells, is neither so extensive nor so accurate, as might now be obtained on the same question by means of suitable and careful inquiry. Adduced as it was, however, by a person of great acuteness, a very philosophical mind, and one who was in other respects highly esteemed by many eminent members of the profession, it produced a very strong and decided impression at the time, when it was published. The prospect of effecting, by means so simple, a cure or recovery in a disease, in which all the usual modes of medical treatment signally failed, was calculated to induce many physicians to try the method with considerable confidence of success; and for several years after the publication of the paper of Dr Wells, several physicians sent consumptive patients, and we have heard of physicians sending sons and daughters with consumptive symptoms, into the fenny districts of England, with the hopes of effecting cures. In truth, for three or four years subsequent to 1812, the great remedy for the removal of consumptive symptoms was, with not a few, residence in a fenny district. The results of this mode of treatment were never very decidedly or satisfactorily made known. Some maintained that they had seen cases in which cures were accomplished; others again spoke doubtfully; and after a few more years, especially after the death of the excellent patron of the method, which took place in September 1817, it appeared to be either tacitly abandoned, or looked upon as a method too uncertain and ambiguous in its results to be resorted to with any confidence.

In 1814 appeared a new investigation of the question. Dr Henry Herbert Southey published in that year a short essay on pulmonary consumption, calculated more perhaps for popular than for professional perusal. Though not very complete, either on the pathological anatomy or etiology of the disease, it communicated, in an agreeable manner and in short compass, much interesting information on the disease, and the best and most approved modes of managing its symptoms and effects. Among other subjects of a therapeutical description, Dr Southey examined with particular care the doctrine of Dr Wells, that residence in fenny districts cures patients labouring under consumption.

Dr Southey first states various facts in favour of the general doctrine of Dr Wells; and then compares with these the facts opposed to that doctrine.

In confirmation of the opinion of Dr Wells, Dr Southey remarks, that in the vale of Keswick, in Cumberland, agues were formerly very common, but have nearly disappeared; and consumption, which is stated by the old inhabitants to have been formerly seldom known there, is now extremely frequent. Mr Archdeacon Blackburn, in a communication to the late Dr Percival, printed in the 65th volume of the Philosophical Transactions, speaking of Richmond in Yorkshire, says, "We have no distempers here which can be called endemial; and when fevers prevail in the neighbourhood, few are affected by them in this town. If any person brings an ague to Richmond, he is generally freed from it in a few days, though the village of Gilling, about a mile and a half distant, which stands low, and has a large pool of stagnant water adjoining to it, is visited with this complaint every spring and autumn. The air of Richmond seems peculiarly unfavourable to consumptive disorders. Many strangers come hither, from different parts, in the first stage of phthisis pulmonalis; but after thirty-five years of experience, I may truly say that not one has recovered, although the utmost care has been paid to their respective cases. In Greenland, Crantz says that agues and fevers were rare, and consumptions very destructive."

The facts in opposition to the doctrine are certainly calculated to shake confidence in its correctness.

"Beja, the part of Alentejo to which phthisical patients resort from Lisbon, stands *high*, and is seen at a considerable distance; but the elevation is gradual, so that there is no perceptible ascent on approaching the city, and there is certainly much marshy ground about it.

"It is to be regretted that Dr Wells has not been able to procure more positive testimony than that of one clergyman to establish the utility of the removal of the phthisical from the high to the fenny parts of Lincolnshire. Dr Harrison, indeed, is quoted to prove the relative infrequency of consumption in the fens, but not as recommending the consumptive to reside there.

"Dr Cookson, of Lincoln, in reply to my inquiry on this subject, states a fact very much in opposition to Dr Wells's hypothesis. 'Upwards of thirty years ago, when he took the charge of the County Hospital at Lincoln, agues were particularly prevalent in that city, which he could not but attribute to the marshy state of the low grounds in the immediate vicinity. These grounds being more completely drained, agues almost entirely disappeared for a long series of years; but pulmonic affections were more prevalent during the former than the latter period. This he attributes in a great measure to scrofula being less frequent than formerly, owing to the use of a more generous diet, &c. The experience of Dr Cookson does not lead him to conclude that pulmonary consumption is less frequent in the fens than in higher situations. He has heard of persons labouring under this disease being sent into the fens for the recovery of health. In as far as the air of lower grounds is milder than that of higher situations, it may be less irritable, and therefore less injurious to the lungs; and from this consideration Dr Cookson has recommended consumptive patients living above a hill to try the air below it. So far from considering ague as opposed to phthisis, he has had occasion more than once to differ in opinion from his medical brethren, pronouncing what they have believed a decided ague to be confirmed phthisis, which it has proved.'

It is in the practical inference from the facts he has collected that Dr Southey thinks Dr Wells has failed. Dr S. doubts not that where intermittents are very destructive, there will be fewer victims to consumption; but this does not depend upon any antagonism between the two diseases, and between the ague and scrofula, as Dr Wells supposes, but because fewer feeble children survive in unhealthy than in healthy situations. Those who, in a more favourable climate might live to the phthisical age, are seldom reared in swamps. Hence the deaths from consumption bear a smaller proportion to the whole mortality in countries infested with agues. That this is the true explanation of the fact, which he allows Dr Wells has established, is shown by communications from physicians practising in the hundreds of Essex, where intermittent fevers most abound. The following extract, from a letter by Dr Hendy of Chelmsford, shows the influence of marsh-air, in the production of strumous diseases in general, and the co-existence of ague and consumption in particular.

"I will endeavour to answer, as fully as I can upon a short notice, the queries which I have received from you on the connection between intermittent fevers and pulmonary consumption. I read Dr Wells's paper with much attention and considerable interest, called forth by my own locality, and by the importance and novelty of the subject. After its perusal, perhaps from wishing that it might be so, the first impression on my mind was, certainly, that upon the whole, during the eleven years that I had been in practice in Essex, I had had fewer cases of phthisis from the more marshy situations where agues abound, than in the immediate neighbourhood of Chelmsford, or from remote situations where they are less prevalent. Scrofula I conceive to be as common, if not more so, in our hundreds, as in the healthier parts of the county; and I repeatedly see it in the form of glandular enlargements about the throat, neck, and axillæ; of emaciated limbs, tumid abdomen, and the symptoms indicating diseased mesentery, and not unfrequently enlarged spleen. Intermittents are common among children; and all the infantile diseases prevail in the hundreds, and assume a more formidable, and frequently more fatal character, than in situations more congenial to health. If therefore I really do see fewer cases of phthisis from the marshy parts of the country, may it not rather be attributed to this obvious cause, that there is here a larger proportion of early victims to unhealthy climate before they reach the phthisical age, than to the absolute or partial exemption from consumption, founded upon the hypothesis of Dr Wells? I have frequently seen phthisis and ague, quotidian as well as tertian, combined; and the fate of the patient hastened by such co-existence. Since the appearance of Dr Wells's paper, I have had four striking instances corroborative of this observation; and I have at the *present* moment a fifth, where ague *preceded* pulmonary consumption after hæmoptysis, for which last the patient consulted me. Within the last week the intermittent has returned with aggravation to the pulmonary affection, and the patient must inevitably soon pay the debt of nature. The idea, therefore, of the incompatibility of the two diseases I conceive to be absolutely erroneous; and consequently the practical inference that pulmonary consumption is to be cured by the supervention of ague must be equally nugatory. In one of the cases to which I have alluded, there was considerable inflammation and erosion of the tarsi of both eyes; and in two of them, (delicate females,) that form and general appearance which indicate indiscriminately the scrofulous or consumptive character. You ask me whether I know of any instances of ague terminating in consumption of the lungs? I may say that I do not precisely know that ague has positively induced consumption, but, in my fifth case, ague preceded phthisis; and from the hundreds (our marshy parts) people come to me under various forms of disease, pulmonary as frequently as anything else, who refer their lost health to preceding ague. The inhabitants of the marshy grounds are disposed to call every symptomatic rigor ague. But the cases to which I have alluded came under my own observation, and the intermittent paroxysms were distinct and well marked.'

From Dr Badely of Chelmsford, Dr Southey gives the following communication:—

"Finding that you are desirous of knowing whether the physicians of this county can corroborate the opinion lately adopted, that consumptions have been cured or prevented by intermittents, I have endeavoured to trace back the experienee of forty years, and cannot bring to my recollection, nor find in my memorandum books, any one case in which that conclusion can be fairly and indisputably drawn. I have indeed heard that a London physician lately sent a patient in the last stage of a pulmonary consumption into the worst part of the hundreds of Essex, for the chance of having it cured by catching an ague, and he died soon after he finished the last stage of his journey. I have read the ingenious and laborious paper of Dr Wells, on the opposition between ague and consumption, and have conversed with Dr Hendy of this town on the subject. We concur in opinion that there is no reason to suppose from our experience that one of these diseases has any influence on the other. We have both had cases of consumption and scrofula from the most agueish parts of the county. Indeed, from consulting my memorandum books, I have had *as* *many* of both diseases from the hundreds as from any other part of the county at the same distance. Some patients have told me that they thought they had a fit of the ague; they described the rigor and every succeeding symptom of an intermittent; but I thought it only a more violent attack of the hectic (which I have seen resemble an intermittent in every circumstance); but, whether hectic or intermittent, the case proved fatal. If Mr John Hunter's opinion be correct, that two diseases of the vascular system never subsist at the same time, it must be useless to send a patient with a hectic fever to catch an ague. Possession, in physic as in law, must be nine points, and the hectic will not resign to the ague.'

These communications Dr Southey thinks decisive. If any class of the consumptive are likely to benefit by removal to marshy situations, it must be the strumous; for Dr Wells has shown that inflammatory affections of the chest often succeed agues, and such inflammations may produce one form of phthisis. It appears, however, that every variety of scrofulous disease is common in the hundreds of Essex. The idea that intermittent fever and scrofula, or scrofulous consumption, depend upon opposite states of the system, must therefore be abandoned.

Dr Southey concludes by regretting that he is obliged to deduce an opposite conclusion from that at which Dr Wells arrives. "When I began this inquiry, I had hoped, by communications from practitioners in the marshy parts of England, to be able to confirm his opinion. Still the public and the profession must feel indebted to him, for showing that many places to which it is usual to send consumptive patients, have been ill chosen; and though the experiment he recommends must rank among the many unsuccessful schemes for the improvement of the healing art, we may apply to it the words of Aëtius:—'*Humanum etiam et plenum benevolentiæ signum est, in extremis etiam malis usque ad experimentum procedere ad difficultatem affectionis compescendam.*'"

Thus, on the one hand, is the evidence adduced by Dr Harrison and Dr Wells; and on the other that adduced by Dr Southey. The doctrine fell almost entirely into a state of abeyance, if not complete neglect; and to this contributed not a little the various works which in the course of years issued from the press either abroad or in this country, on diseases of the lungs.

It has been shown, that Dr Herbert Southey was the first who applied to this alleged property of the incompatibility of ague and marsh fever with pulmonary consumption, the name of antagonism; and this denomination, which has also been employed by various subsequent writers, it will be convenient to retain, as designating with sufficient accuracy the property, whether it be proved to exist or not.

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* Observations on Pulmonary Consumption. By Henry Herbert Southey, M. D. London 1814, 8vo.

It is now requisite to advert to the subsequent course of inquiry on this subject.

A short account of the medical topography of the Odenwald, by Dr Frederick Ebel, published in June 1840, presents some instructive facts.

The name Odenwald is given to a tract of territory which extends between the Neckar and the Maine, from the Rhine to the district of the Jaxt and Tauber. The hills of the Odenwald are of moderate elevation, in general rounded hills, and none exceed 3000 feet above the level of the sea. The forest tracts are well cleared; but here and there are seen large connected woody tracts, and smaller woods on the mountain elevations. Agriculture, the keeping of cattle, and the timber trade, are the chief sources of industry and revenue to the inhabitants. Towns with trade are rare. The most common are weavers of linen cloth. In various parts are forges, potash manufactories, paper mills, and similar establishments.

The circle of Waldmichelbach lies between the counties of Erbach-Erbach and Erbach-Furstenau and the mountain tract. Its extent is about three square German miles. It belongs to the highest region of the Odenwald. The climate is a little rough, the temperature very changeable. The highest barometer indication is 28 inches 6; the lowest 26 inches 9; the medium 27 inches 6. The highest thermometrical indication is + 27.90 R. = 94° F.; the lowest —19.20 = —12° F. The prevailing winds are south-west and north-west, which renders the air rather moist and cold, than dry and warm.

The circle contains 1693 habitations. The number of inhabitants at the end of 1838 was 13,686, of whom 6,869 were males, and 6817 were females. At an average, annually, 106 marriages take place, and 324 persons die annually. The physical constitution of the inhabitants is robust; their complexion fresh. Among them are many aged persons, and few rickety and scrofulous persons are seen.

The number of diseases is inconsiderable. Almost all diseases, especially the febrile, have an inflammatory character. Intermittents, as also epidemics, are rare. Asthmatic diseases are frequent. Many persons fall victims to consumption; yet this malady is rarely dependent on phthisical habit; more commonly it is the consequence of neglected catarrhs and pneumonic inflammations, and of imperfectly treated and suppressed cutaneous eruptions, especially itch.*

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* Hufeland and Osann's Journal der Praktischen Heilkunde, 1840. Junii. S. 80–107.

In 1843, Dr Brockmann of Clausthal published an essay, recommending the Oberharz as a place of protection against pulmonary consumption, and a situation for curing the disease. The author allows that the belief is so general, both in the profession and without it, that the climatic relations of the Oberharz exert an injurious effect on the delicate organisation of the lungs, that it appears that both theory and practice must be against the idea, that the region should be admissible as a residence for the phthisical. He is convinced, however, from long experience, that nothing is better for maintaining the organs of respiration in a sound state, and even curing diseased lungs, than a residence in this elevated region of northern Germany.

The general statement of Dr Brockmann is, that tubercular consumption is an uncommonly rare disease among persons born in the Oberharz and brought up in it from childhood. This, he maintains, on the fact that among 80,000 instances of disease treated by him, only 23 were specified as referable to the head of tubercular disease of the lungs; and of these 23, only 14 were born in the Oberharz, or had been in it from youth; the other 9 were brought to it in far advanced stages of the disease. Tubercular disease of the lungs is observed comparatively least frequently in the elevated parts of the Oberharz, so that the law seems to be, the higher and more open the mountain table-land, the less frequent is tubercular disease. Next in this respect come the hill-towns of Clausthal and Zellerfeld. He allows that there are in the Oberharz two forms of lung disease, difficult to be distinguished from phthisis, but which are different. One is *melanosis* of the lungs, which he states is there very common, and is called the mountain disease (die Bergsucht). The other is a sort of catarrh of the lungs dependent upon gouty influence.

The author enters into a lengthened explanation of the mode in which he conceives the climate of the Oberharz operates in preventing and curing phthisical disorders. But on the actual fact he gives no more information than what is now stated.*

The Essay of Dr Brockmann seems to be an attempt to ascertain how far human credulity may be stretched. It is impossible to believe that 80,000 examples of disease were seen by any single individual.

M. Boudin, one of the physicians to the French army, first in the Morea in 1828, and afterwards in Africa, had been led when in Greece to observe that the typhoid and pulmonary disorders which were usually prevalent in France, disappeared in the Peloponnesus, and were there represented by intermittent and remittent fevers and diseases of the colon.

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* Der Oberharz, ein Schutz-und Heilort fur tuberculose Lungenschwindsucht. Von Dr Brockmann zu Clausthal. Hannoverische Annalen, 1843, Sept. und October.

Taking for a fact what he saw, that pulmonary consumption and typhoid fever were rare disorders in the ports of the Peloponnesus, he inquired whether this were a local phenomenon or determined by conditions which in other places might produce similar results. In 1841, when he published his treatise on intermittent fevers, he promulgated his opinion in regular form on this question. But he complains that, whether the minds of the profession were not prepared to receive a proposition in general pathology, withdrawing them from the details of the dissecting theatre, or from some other cause, the proposition and inquiry regarding antagonism received no attention.

M. Boudin again solicited attention to this question by an elaborate essay in the Annales d'Hygiene for 1845. As it is manifest that the author has anew considered the subject with increased care and information, and wishes this memoir to be regarded as containing his most matured and finished ideas on the question, to this principally we refer, without regarding his previous researches, in the account of his inquiries now to be given.

M. Boudin maintains the antagonism of marsh fever not only with pulmonary consumption, but with typhous and typhoid fever. The most important facts only are selected.

At Grasse, accord to M. Isnard, many persons labouring under tubercular diseases are observed, and rarely intermittent fevers; while on the banks of the Var, for instance at Cagnes, where marsh diseases are very common, consumption is very rare.

At Aigues-Mortes, according to M. Dax, the most common chronic diseases are rheumatisms, obstructions, mostly those of the spleen, dropsies, and humid asthma. Pulmonary consumption is very rare. Of the same locality, M. Tribe says, consumptive disorders, which are here unfrequent, pursue a course greatly more slow than in districts void of marshes. When consumption is seen, it is rather accidental than hereditary. The disease attacks almost none but females. It is rarely seen among the labourers working among the marshes.*

The town of Meze, according to M. Santy, situate on the margins of a pond, has seen disappear, in the course of several years, the multiplied marshes which are in its vicinity. Its fortifications have been thrown down; its streets enlarged; and the number of intermittents has greatly diminished. The older inhabitants maintain that formerly diseases of the chest were very rare; and as fevers have now diminished, consumption has become more frequent.

In the department of Ain, according to M. Nepple, tubercular consumption and scrofula are the two diseases which most rarely attack the inhabitants of the marshes of La Bresse. On the other hand, tubercular diseases are often observed in the countries adjoining this province.

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* Tribe De l'Heureux influence des localités marecageuses sur la tuberculisation pulmonaire, Montpellier, 1843.

In 1843, this physician addressed to the Academy of Sciences a letter containing the following statements:—

"The fact of the rarity of phthisis in fenny localities is to me not a matter of doubt; and this rarity has always appeared to me to bear a direct proportion to the intensity of the elements of impaludescence, and to diminish with the diminution of these elements; so that, if in districts situate in the centre of ponds, we scarcely observe one phthisical patient, we find a number progressively increasing, in proportion as we remove from the centre of fenny districts. From this it results, that at a certain point are found united both tubercular lungs and intermittent fevers. Thus, Montluel, where I reside, is far from being without consumptive patients, notwithstanding the annual prevalence of intermittent fevers. But the miasms by which these fevers are produced reach the town, after traversing one-fourth of a league; and their influence is weak, transitory, and purely febriferous. The organism at large undergoes no permanent modification, capable of opposing the process of tuberculisation. In the centre of the marshes it is entirely different." As to typhoid fever, he is unable to make any answer.

In a letter to the same physician, M. Pacoud, physician to the hospital at Bourg, makes the following statement:—"During more than 45 years' practice, I have not observed one single fact at variance with the observations made by you in the neighbourhood of Montluel. My professional duties led me formerly far into the marshy district; my recollection and my notes furnish no trace of tubercular phthisis. The hospital of Bourg, which receives many patients from these regions, has not among them received one single case of phthisis. One of my colleagues, Dr Hudelet, who has often been called into the centre of the marshes, cannot remember having ever met with one single instance of consumption."

MM. Candy and Rater, physicians to the Hotel Dieu at Lyons, state that they had made the analogous observation for a long period in the marshy plains of Forez. M. Candy adds that since the hygienic state of the country has been improved, phthisis began to be in it more frequent. M. Arofrein, physician at Chatillon-les-Dombes, informed M. N. that phthisis is in his district very rare; for three years, and among a total mortality of 400 persons, including those in the hospital, were only 8 phthisical cases, of which one occurred in a stranger to the country. This town, nevertheless, is not situate in the most marshy part of La Bresse.

In the return of the mortality among the convicts at the galleys, communicated by M. Chassinat to the Academy of Medicine, the deaths by pulmonary consumption bear to those by other diseases proportions indicated by the following figures :—

At Brest, . . .	21.5 per cent.
At Toulon, . . .	4.5 per cent.
At Rochefort, . . .	2.8 per cent.

Thus, in the marshes at Rochefort, consumption causes among the convicts two times fewer victims than at Toulon, and nine (eight) times fewer than at Brest.

To show the relation of those diseases in Paris, the mortality list of the Military Hospital of Gros-Caillou for the first six months of 1835, is adduced :—

General Mortality, . .	297 deaths.
Typhoid fevers and consumption,	125 ,,
Intermittent fevers, .	0 ,,

During the second half of the same years, two regiments from the marshy localities of Morbihan and the Lower Charente furnished 585 cases of ague, and only 13 cases of typhoid fever. It is well known that consumption is a very prevalent disease in Paris.

M. de Crozant has published four cases of recovery from phthisis by residence in the marshes of Nievre. The first two are by M. Lizon.

3. J. C., by trade a miller, aged 27, strong and well made, living for some time at Sully-Latour, in a mill situate on the left bank of the Noain, had difficult breathing, cough rather dry, fever, and dulness on percussion at the anterior and upper part of the left lung, with feebleness of respiratory murmur at the same point. On the 13th July 1829, when first visited, he was bled, ordered rest, regulated diet, and emollient drinks.

On the 29th August, six weeks after, he was emaciated, had diarrhœa and profuse sweatings ; much cough, copious expectoration of purulent matter, with blowing and pectoriloquy at the spot already specified.

Between the 29th of August and the 3d October, M. L. saw this patient five times, and, contrary to expectation, though the symptoms furnished by auscultation were nearly the same, and he coughed much, his general state was much improved, and his strength gradually returned. When he was next seen, on the 24th of June 1830, he was quite re-established. The blowing sound was still audible at the part indicated. On the 23d December 1843, thirteen years after he was first seen, M. L. recognised in the site of the former cavern nothing unusual.

4. On the 13th of April 1839, M. Lizon saw in the parish of Sully-Latour, a young girl of 19, wasted and ill for a long time, with cough, purulent expectoration, sweating, diarrhœa, and con-

stant fever. Pectoriloquy and the usual signs of a large cavity at the upper and anterior part of the lung were distinct. A mild regimen and balsamic pastilles were prescribed.

In May 1840, fifteen months after, M. L. met her in a meadow keeping sheep. She stated that she was then well, and, though meagre, yet able to perform her usual duties. The cough and expectoration had ceased for some time.

5. In July or August 1829, M. C. saw a female servant who had been for two years in one of the healthiest villages of the parish of Sully. She was pale and emaciated, and affected with quotidian fever, which had resisted all the preparations of quinine. She had laboured under hemoptysis, had profuse expectoration, oppression at the breast, and copious night sweats. M. C. does not remember the physical signs, but the general physiological symptoms were characteristic of phthisis.

She passed the winter in the same state till the spring of 1840; and in the month of August, when she was again seen, M. L. established the existence of a large vomica at the apex of the right lung. Over the rest of the chest were mucous and crepitant rattles, which were also heard near the top of the left lung. Diarrhœa was frequent, and shivering and fever were regular. After about two months, during which she was seen daily, and presented the same symptoms, she left the village, and came to reside in a country house, on the banks of a stream, in a castle surrounded by insalubrious ditches, situate in a hollow in a marshy and very agueish soil. On leaving the place, M. C. believed that she could not outlive the winter. This, however, was not the case.

The disorder dragged on; and in May 1841, she was in the last stage of wasting and consumption. There was, however, no gurgling; the rattles had disappeared from the whole of the chest, excepting under the right collar bone. The expectoration was still purulent. Amidst many unfavourable symptoms, weakness, fainting fits, and wasting, she passed over another winter; and in the spring of 1842 began to recover strength. In summer, M. C. found her quite well, and he therefore believed that he was mistaken in his diagnosis. Upon exploring the chest, however, he found on the left the blowing sound, the existence of which he had previously ascertained, without rattle; respiration good in the whole of the rest of the chest, even under the right collar bone; fever and sweating gone; diarrhœa unfrequent; appetite good; sometimes expectoration, but no blood brought up for five or six months.

In 1843, M. C. found this patient in perfect health, without cough or expectoration, performing the laborious duties of a labouring woman in the country, washing, working in the fields, &c. According to her own statement, her complete recovery, that is, disappearance of cough and expectoration, dated from September or October 1842, that is to say, a space of fifteen months. During the residence of M. C. in the country, he several times examined the chest, and was thence led to believe that the cure was complete. On the left, under the collar bone, respiration was prolonged, and possessed still a blowing character; but in all other parts of the chest it was well performed.

6. In May 1841, M. C. was requested to see, about a quarter of a league from where he was, a young man of eighteen years, who was regarded by the medical attendant as having but a short time to live. The patient was a miller with his father, at Moulin Neuf (New Mill), on the Noain. It was manifest that the diagnosis was correct. The patient had an emaciated, miserable appearance, like all the children of the town of Sully, and looked like not more than thirteen years of age. He had always been sickly, which was ascribed to marsh fever, and had been treated accordingly. Cough was habitual, and the previous year, nearly at the same season, he had been confined to bed for one month by the same disorder. Since this time his strength had failed; he had coughed up much blood during and since the illness; he had night sweats, diarrhœa, cough, and copious expectoration.

For three weeks, when seen by M. C., he had not left his bed, worn down by incessant and profuse diarrhœa. The physical signs were, in the left, crepitating rattles under the collar bone, a little dulness behind, blowing without rattle; respiration rustling in the residue of the lung. On the right, anteriorly, under the collar bone, cavernous blowing very strong, with gurgling, and a very dull sound; the rest of the lung appeared sound.

During four or five times that this patient was seen, only trifling remedies were prescribed, excepting an emetic, which was ordered, because it was observed that he swallowed the expectoration. During all this time, a space of two months, no change was observed.

Next year, in 1842, M. C. was informed that this patient was on his legs, neither coughing nor expectorating; eating well, and performing work in the mill. He had been advised to take a vegetable remedy, M. C. thinks the *pervinca;* that he had recovered his strength, sweating and diarrhœa having subsided gradually, and at length disappeared; that he had never left his moist abode; and that fever had not returned for eight or ten months.

In the summer of 1843 M. C. again saw this young person. He was then a lad of twenty-one years, well-formed, vigorous, and presenting no external trace of the wretched condition in which he was seen three years previously, and whom it was difficult to recognize as the sickly boy, whom he had previously treated. On exploration of the chest, he recognised no sign. The anterior and superior part of the right side of the chest was only a little less arched than on the left side; and respiration was a little less intense than in other points of the thoracic walls. He continued to work at the mill, travelled the roads to convey bakings, carried on his back sacks of flour, was constantly exposed to cold, and enjoyed in all respects excellent health.

In perusing the cases now given, a question naturally arises; where did the patients contract the phthisical symptoms? There is no evidence to prove that these patients had been in any other more dry district; and the reader is left to infer, that the pulmonary disorder arose where the patient was dwelling, that is, in the midst of the marshy regions.

In an account of the Medical Topography of Berlin, by Dr Wollheim, the following observations are made. Sand constitutes the essential part of the soil. The fields in the vicinity of the city are very seldom inundated; and, under all circumstances, the water disappears rapidly in the sand, in which it never produces *miasmata*. Here is no endemial disposition favourable to the production of intermittent fever. The country has neither ponds nor marshes. In the three years from 1839 to 1841, there was observed an annual average of one death by consumption among $8\frac{7}{12}$ deaths; and typhoid fever forms a large proportion of the general mortality.*

At Dresden, according to Dr Mayer, intermittent fevers were formerly very frequent. It may be said, that in proportion as these distempers have diminished in frequency in the suburb of Wilsdruft, typhoid fevers, which formerly were less frequent, have begun to appear. Tubercular phthisis of the lungs is here very frequent.

It is unnecessary to reproduce here all the details of M. Boudin, several of which have been formerly considered more or less fully in the pages of this Journal; while others, relating to the alleged antagonism of ague and typhoid fever, do not, it may be said, bear very directly on the question under consideration. Some of the facts also advanced, though not unimportant, do not, it appears to us, tend to determine the question. Thus, when it is stated that at Senegal, during the second six months of 1837, and the first of 1838, among 952 patients admitted to the hospital of St Louis, were 428 cases of ague, 12 cases of pernicious fever, and 59 remittents, without either one case of typhoid fever or of consumption, we merely learn the old and well-known fact, that the endemic diseases of the West African coast are miasmatic fevers of various degrees of intensity and virulence, that typhoid fevers are very unusual in hot and equinoctial regions, and that consumption is little known in the same division of the terraqueous globe.

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* Versuch einer Mediz. Topographie und Statistik. Berlin, 1844.

The general inferences deduced by M. Boudin will show what propositions he thinks may be and are proved by his inquiries.

1. The localities in which the genetic cause of endemic intermittent fevers, communicates to man a deep modification, are distinguished by the comparative rarity of pulmonary consumption and typhoid fever.

2. The localities in which typhoid fever and pulmonary consumption are strongly prevalent are remarkable for the rarity and small degree of severity of intermittent fevers contracted on the spot.

3. The desiccation of a marshy soil, or its conversion into a pond, by causing the disappearance or the diminution of marshy diseases, seems to dispose the organism to a new pathological condition, in which pulmonary consumption, and, according to the geographical position of the place, typhoid fever, render themselves particularly conspicuous.

4. Man, after having resided in a country with a well-marked marshy character, presents against typhoid fever an amount of immunity, the degree and duration of which are in the direct and compound ratio; 1*st*, of the duration of the previous residence; 2*d*, of the intensity of expression attained by marsh fevers, under the twofold relation of form and type. This denotes, in other terms, that, dwelling in a country with remittent and continuous fevers, such as are certain points of the coast of Algeria and the centre of the marshy district of La Bresse, is more powerfully preservative against the diseases now spoken of, than would be, for instance, residence at the marshy outlet of Bievre at Paris.

5. The geographical conditions of latitude and longitude, and elevation above the level of the sea, which set bounds to the developement of marsh fevers, establish in like manner a limit to the sanative influence of the marshy element.

6. *Lastly*, Certain conditions of race and perhaps of sex, by diminishing the impressibility of the organism to the productive cause of marsh fevers, would at the same time diminish the sanative efficacy of this agent.

M. Boudin thinks, that in applying these principles to practical purposes, in attempting the cure of consumption, very decided encouragement is given, and a strong argument established by the beneficial results obtained for several years past in preventing the progress and effecting the cure of cretinism, by the simple elevation of children attacked by that disease, above the orographical zone in which cretins are born; most commonly between the two pathological lines of those affected with goitre. It is observed in the Norican Alps, that cretinism is seen between 1394 and 3600 feet of elevation above the level of the sea, never below the former line or above the latter. It is, therefore, without these limits that it is requisite, at least in this region of the globe, to place cretin children. In like manner, M. Boudin recommends placing phthisical individuals beyond the limits where consumption prevails.*

Some practical illustrations of the value of these principles, Dr Green adduces in the work introduced to the reader in last number. The facts are important, whatever may be thought of the theory.

In 1840, Dr Green communicated to the New York Journal of Medicine and Surgery some "Observations on the Influence of Malarious Atmosphere, in the prevention and cure of Phthisis Pulmonalis." His object, in that communication, was to demonstrate by facts and observations, the non-existence of pulmonary consumption, in those localities in the United States, in which intermittent fevers prevail; and to show, that, while those places are exempt from the disease, the inhabitants of others, in their immediate vicinity, but where marsh exhalations do not exist, are affected with pulmonary diseases to an unusual extent; although subjected to the same influences of temperature, habits, occupations, &c. Several cases, which came under his own observation, were given where persons presenting marked symptoms of tubercular phthisis had been restored to perfect health, apparently by residing in malarious districts.

From among the most interesting of these instances the following are recorded:—

7. A young lady, aged 16, had been labouring, for several months, under symptoms of incipient phthisis. She was hereditarily predisposed to the disease. Her mother and an elder sister, and several near relations on her father's side, had died of consumption. The prominent symptoms were, short, dry cough; pain in the left side; a burning in the palms of the hands—particularly at night; dyspnœa following the least exercise, lassitude, &c.;—symptoms which were remarked by herself and the family as being the same with which her elder sister, who died, had been affected. With the other members of the family, medical treatment had, apparently, no salutary effect. Indeed, it seemed to have hurried them with greater rapidity to the grave. Under these circumstances, Dr G. advised her father to send her into the vicinity of the lakes, where she might be subjected to the influence of an *intermittent* atmosphere. For this purpose she spent the summer of 1831 in Whitehall. She had not been there many months before there was an evident improvement in her symptoms. Before the close of summer she had an attack of intermittent fever. It was slight,—having ceased after one or two paroxysms. Her improvement, after this, was rapid; and before winter, she re-

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* De l'Influence des localités Marecageuses sur la frequence et la marche de la Phthisie pulmonaire et de la Fievre Typhoide; Par Le Dr Boudin, Medecin en chef de l'Hopital Militaire de Versailles. Annales D'Hygiene Publique et de Medecine Legale. T. 33ieme. Paris, Janvier 1845, p. 58, &c.

turned to her father with restored health. She afterwards married a gentleman in New York, and, up to the present time (1846), has enjoyed uninterrupted health.

The two following cases came under Dr Green's observation in New York.

8. A young gentleman, about 24 years old, of a consumptive family, suffered severely from an attack of the influenza, which prevailed to some extent in New York, in the winter of 1837. He came under the care of Dr G. the latter part of that winter, at which time he exhibited the following symptoms:—A frequent, hard cough, unattended with much expectoration; constant pain in the chest; pulse 100; debility; loss of appetite; tongue coated; respiration a little accelerated; skin hot and dry, during the latter part of the day, with some perspiration at night.

The ordinary remedies were employed, which were followed with some abatement of the cough, and the pain in the chest.

On the tenth day after Dr G. saw him, he commenced expectorating blood, which continued several days. At the end of three weeks, his strength had improved and his cough had considerably abated; but, as these primary symptoms of a pulmonary affection still remained in a great degree, Dr G. advised his leaving the city and seeking a more genial clime.

He went first to Ohio, where he remained several months, and thence proceeded to Michigan, where, in the spring of 1838, he had an attack of intermittent fever. He returned to New York about six months ago in perfect health, not a vestige of that affection remaining which he carried away with him.

9. In November 1836, Dr H., a practising physician of New York, caught a severe cold, which was followed by cough, and in a few weeks with expectoration of purulent matter. His cough continuing about three weeks from the attack, hæmoptysis supervened, and this was followed for some time with bloody and muco-purulent expectoration.

These symptoms of phthisis becoming more alarming, as the winter advanced, he relinquished his practice, and sailed for Mobile early in January 1838. So unfavourable did his symptoms appear at this time, that one of the oldest and most experienced physicians of this city remarked, after taking leave of him, that 'the Doctor would never live to return to New York.'

On the 4th of February he arrived at Mobile, where he remained several months; but went to New Orleans the June following, and thence to Indiana; where, in August of the same year, he had an attack of ague, which continued for some time. About eight months after, he returned to New York in confirmed health, and resumed his practice, and up to the present day has had no return whatever of his pulmonary symptoms.

10. A young woman, labouring under consumption,—apparently in its confirmed secondary stage,—was brought to Castleton, the residence of Professor Woodward, to die among her friends. Her mother resided upon the borders of a small marshy lake in the westerly part of the town,—a neighbourhood where all new residents are sure to be affected with intermittent fever. Thither she was carried, and Dr Woodward was called to attend upon her. He found her, as he informed Dr G., exhibiting every symptom of ulcerated lungs. Indeed, so apparently hopeless was the case, that the medicines he prescribed were merely palliative; and he informed her friends, that no permanent benefit could be expected in her case from the adoption of any means.

Several months after this, being in that neighbourhood, he learned with surprise that his patient was recovering; and on calling to see her, he, in fact, found her nearly restored. Her cough, and every other unfavourable symptom had left her. Her health since has been permanently established.

Dr Woodward gave it as his opinion, that in this case,—as well as in some other similar ones, with which he has been familiar,—the persons were restored to health by breathing an intermittent atmosphere.

"If we examine into the past history of New York, the same facts will be established. Cadwallader Colden, who wrote an account of the climate and diseases of New York, more than one hundred years ago, says, in speaking of the diseases of that day, 'we have few consumptions or diseases of the lungs. I never heard of a broken-winded horse in this country. People inclined to consumption in England are often perfectly cured by our fine air. It would seem that the climate, at this early period of our country, when the winters were long and intensely cold, would have been much better calculated to induce pulmonary affections, than it is at the present day.

"According to the testimony of the same writer, the winter then commenced about the middle of November, and continued severe until March. During this period the Hudson river was often 'frozen over at the town, where it is about two miles broad and the water very salt, so that people passed over upon the ice in crowds.'

"At that time, and for many years subsequent to that period, New York was surrounded with lagoons and marshy grounds, from whence, during the summer months, those malarious exhalations arose, which so often proved the exciting cause of intermitting fevers, cholera morbus, and fluxes, which, as the above writer states, were the prevailing diseases of that day.

"As improvements have advanced, these fenny grounds and stagnant waters have been drained, the sunken places filled up, and intermittent fevers have as gradually declined. But with this declension of ague, phthisis pulmonalis has steadily and fearfully increased."

From having been engaged, for several years, in the early part of his professional life, in practising, in the vicinity of marshy districts, Dr Green observed many facts on this subject, and was, long since, well convinced of the incompatibility of pulmonary phthisis and intermittent fever. Accordingly, for many years he has been in the practice of advising patients, who were labouring under phthisis, or follicular disease complicated with phthisis, to visit places where an aguish atmosphere prevails. In many instances the result has been decidedly beneficial.

The most recent speculator on this subject is Dr Helfft of Berlin, who has examined the antagonism of marsh fevers and consumption in an Essay published in 1848.

Dr Helfft takes the opposite side, and, like Dr Southey, calls in question more or less decidedly the protecting power of marsh atmosphere against the approach and ravages of consumption. Levacher, he observes, demonstrates, that in the marshy districts of the West Indies intermittent and remittent fever do not exclude pulmonary consumption, neither as to frequency of occurrence nor its dangers. Chisholm also considers this disease as very common in the islands of the Indian Ocean. At Peru, according to Tschudi,* it is as frequent as is intermittent fever. In Brazil, which is often ravaged by febrile distempers, consumption destroys one-fifth of the population, according to the estimate of Sigaud, the author of a work on the medical topography of that country.

Amidst facts so conclusive, it appears singular to see French physicians, among others M. Casimir Broussais, attaching great importance to the favourable influence of the climate of Algeria upon phthisical persons. M. Casimir Broussais maintains that pulmonary consumption is infinitely more rare in Algeria than it is in France; and that this immunity depends exclusively on climatic peculiarities. Among those, he adds, who die of different diseases, inspection proves that the lungs are almost always void of tubercles. This statement, however, is far from being absolutely correct, and marshy countries themselves are not incompatible with diseases of the lungs. M. Bonnafous has also remarked, that, during winter and spring, diseases of the lungs are pretty generally prevalent in Algeria, in consequence of the numerous variations which the temperature undergoes. But as the atmosphere is never cooled to so great a degree as in countries in northern latitudes, the pernicious effects of these changes are much less conspicuous, and the progress of consumption is often retarded, in so far as the disease may admit of cure. It results, then, that the French physicians themselves do not consider as identical in all places and under all circumstances, the influence of telluric miasms on the formation and progressive changes of pulmonary tubercles.

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* The number of deaths given by Dr Tschudi in the population of Lima, consisting of 54,628, varies annually from 2500 to 2800. In 1841, when the deaths amounted from all causes to 2244, those by intermittent fever were 216, namely, 57 men, 88 women, and 71 children; and those by pulmonary consumption were 208, namely, 87 males, 110 females, and 11 children. Besides the 216 deaths by intermittents, there were 72 by dropsy, mostly the consequence of intermittent fevers. From these facts it manifestly results, that ague and pulmonary consumption do not in Lima exclude each other, both forming about from 1-10th to 1-11th of the entire mortality.—Edinburgh Medical and Surgical Journal, Vol. lxix. p. 487.

The general conclusions deduced by Dr Helfft are the following :—

1. That marsh or telluric miasms, considered in themselves, possess not the antiphthisical property which has been ascribed to them ; and that, in order to appreciate justly their action, it is always necessary to take into consideration the state of the temperature, its uniformity, the hygrometrical conditions of the atmosphere, the predominant winds, and the other atmospherical changes of the country, which forms the subject of inquiry.

2. That a uniform atmosphere, impregnated with miasms, without being too moist, forms the best preservative or palliative remedy for incipient phthisis.

It has been usually believed, that hot climates are opposed to the progress and the formation of pulmonary consumption. This condition, however, appears to be rather hurtful than advantageous, unless it be associated with stability in temperature, and with a certain degree of dryness of the atmosphere. In the Antilles, where the heat of the day is succeeded by cold moist nights, consumption and intermittent fever are both common diseases ; whereas in British Guiana, where the temperature is remarkably uniform, consumption is unknown on the coasts.

Excessive dryness, in the same manner as excessive heat, are not less injurious than atmospherical vicissitudes. The town of Hyeres, which it has been proposed to make a species of colony for phthisical patients, is far from answering the expectations which have been formed of it, in consequence of the prevalence of north-east winds, which are harsh and dry. Casper observes, that the mortality of phthisical patients is at its minimum, only when the atmosphere maintains the medium between extreme dryness and excessive humidity. In the island of Madeira, where the temperature is mild and uniform, and the air moderately moist, consumption is very rare, notwithstanding the infrequency of intermittent fever. It is the same with the Azores, according to Dr Bulard, where, among 465 examples of chronic diseases, were only two phthisical patients. It must not, however, be imagined that in these privileged countries the disease may recede, when it is once confirmed. Dr Kumpfer states positively, in his notes on the island of Madeira, that the disease follows there its course fully, and is often terminated more rapidly than in the northern countries.[*] Dr Heydek mentions, that among 35 phthisical persons who spent the year 1831 at Madeira, 3 died the first month of their residence, 5 or 6 perished at the close of the winter season, 5 or 6 more after the approach of spring; and in 1834 only 13 survivors were left. All these observations have been confirmed by those of the French physicians in Algeria.

The comparative frequency of pulmonary consumption in different races has occupied the attention of several observers, among others, both M. Boudin and Dr Helfft. The former shows from the army medical reports of the English West Indian colonies, that the great majority of the fevers which attack the white forces are of marsh and telluric origin; that the black or negro troops suffer little from diseases of this class, but very much from diseases of the chest in general, and consumption in particular; and that tubercular consumption constitutes of the diseases of the lungs a proportion varying from three-fourths to four-fifths. Dr Helfft agrees that the antagonism between pulmonary consumption and marsh and telluric fever, is very remarkable in the different races inhabiting the equinoctial regions, and countries bordering on them. He regards it as at present demonstrated, that the negro race enjoy a species of immunity as to fever, while pulmonary consumption causes among them great ravages. The Indians, that is, the copper-coloured aboriginal Americans, Dr Tschudi observes, are much more subject to fever than the white races, and these than the negroes, who labour with impunity for entire days and years amidst marshes. At Senegal, in like manner, the negroes are exempt from fevers; but they are very liable to affections of the chest. Consumption destroys one-fifteenth among the natives; while among 100 instances of death among Europeans, Dr Thevenot states that scarcely are there six cases of consumption.[†] Dr Jalisant, in like manner, at Rio Janeiro, shows the comparative rarity of intermittent fevers among the African negroes.

At Martinique M. Rufz counted, among 92 phthisical patients, 48 creoles, 22 mulattoes, 19 creole negroes, and only 3 Europeans.[‡]

A similar result has been observed in Algeria. Dr Guyon observed, that consumption is a more frequent and a more fatal disease among the natives, the Moors, and the Jews, than among the Europeans, who, on the other hand, often die by intermittent and remittent fevers.

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[*] Journal d'Oppenheim. Band. xxxiv.

[†] Thevenot Traité des Maladies des Europeens au Senegal. Paris, 1840.

[‡] Bulletins de l'Academie Royale de Medecine, T. vii.

Dr Helfft, therefore, admits that, though the antagonism of marsh and telluric fevers to tubercular consumption, may be contested on general grounds, yet it appears to hold good among the different races who inhabit marshy countries. He concludes with the two following inferences.

1. In marshy countries, the natives, especially if they are negroes or men of colour, are a great deal more liable to pulmonary consumption than the whites, strangers, and Europeans, who, on the other hand, are more frequently the victims of intermittent and remittent, or marsh and telluric fevers.

2. The sanative powers of febriferous countries in pulmonary consumption, consist not so much in the miasms, as in the uniformity of temperature, the heat of the atmosphere, a moderate degree of moisture, and the absence of dry harsh winds.*

This may be said to form the summary of the evidence at present known on the question of the alleged antagonism of marsh fever and pulmonary consumption. It is manifest that the evidence is rather contradictory; and such it will probably remain for some time. Upon the whole, the second deduction given by Dr Helfft accords, we believe, more with the experience of physicians in this country, than the propositions maintained by M. Boudin and Dr Green. At the same time, the facts adduced by these writers, and especially the cases given by Dr Green, are entitled to careful attention; and to those who are situate in favourable circumstances for observation, it must be an inquiry both interesting and useful, to ascertain whether the facts which come under their own observation, afford either confirmation of those given by Dr Green, or contradiction to them, or require them to be modified.

The foregoing sketch gives a view of the present state of information on this question, and the respective researches of each inquirer, up to the present time, as near as is possible, without entering into minute details, for which the reader may consult the memoir of M. Boudin. In that part of the inquiry which relates to the British dominions, a very great change has taken place in the course of thirty-five years, since the question was last subjected to formal investigation. This change has been so great, that, if it do not nullify all previous facts adduced and inferences drawn, it would render it requisite to examine the whole subject anew. Both ague and remittent fever have been progressively reduced, even in ague-producing districts, as Essex, Norfolk, and Lincolnshire, in the lapse of more than one-third of a century, to a very small proportion. It must be observed, nevertheless, that these diseases, though progressively diminishing, do not undergo

* Zeitschrift fur gesammte Medicin, B. 3, s. 360.

a uniform steady diminution. Thus it appears that the deaths by ague were considerably more numerous in 1840 and 1841 than in 1838 and 1839, and those by remittent more numerous in 1838 and 1840 than in 1839 and in 1841. The numbers of both diseases, according to the Reports of the Registrar-General for the four years specified, are as follow ;—

	1838	1839	1840	1841
Total mortality from all causes,	342,547	338,979	359,634	343,847
Ague,	44	95	133	135
Remittent fever,	182	136	248	149
Typhus,	18,775	15,666	17,177	14,846
Phthisis,	59,025	59,559	59,923	59,592

During the same four years typhus destroyed annually from 14,846 to 18,775, or upon an average annually, 16,613 persons.

Consumption has never destroyed fewer than 59,000 persons in each of the same four years; and in one year, 1840, its ravages approach very near to 60,000 persons. This may be believed to show an increase, since the time at which Dr Woolcombe wrote, in 1808, when he estimated the annual mortality by consumption at not less than 55,000 persons. It is an absolute but not a relative increase. In truth, if Dr Woolcombe's calculations be at all correct, and not vitiated by any serious error, it is a diminution, considering the great increase of the population, and the amount of the general and total mortality. At that time the population of England and Wales was little below ten millions; and, including Scotland, it was stated at eleven millions. In 1841, the period to which these numbers refer, the entire population of England and Wales was found, after a census taken with particular care to insure accuracy and avoid errors, to amount to 15,911,757, and that of Scotland to be 2,620,184. The mortality of 55,000 persons, however, forms a much larger proportion to ten millions than that of 60,000 does to sixteen millions. If, indeed, the mortality by consumption had been proceeding at the same rate since 1808 and 1810, as that at which the population has been increasing since that time, that disease ought to have caused the death of 80,000 persons in a population of sixteen millions. It causes 20,000 fewer than this estimated number; and the conclusion which naturally and necessarily follows, is that, comparatively speaking, pulmonary consumption is from one-third to one-fourth a less prevalent or less fatal disease than previous to 1808.

It would lead into too minute details, to show in what manner these facts and inferences affect the question now under consideration. If all these deductions be correct, both ague and consumption are on the diminution in frequency. Antagonism, therefore, seems between these two diseases not to rest on very certain foundations. But it is almost absurd to compare together two diseases, the lethiferous powers of which are, in this country, so very different. At a future opportunity we may take occasion to examine the question more fully.

ART. VII.—*On the Mortality of Edinburgh and Leith for the year* 1848, *with Remarks on the Mortality prevailing in the chief Towns of Scotland during that period.* By JAMES STARK, M. D., Fellow of the Royal College of Physicians of Edinburgh.

THE mortality of Edinburgh during the year 1848 amounted to 5754,—2759 being males, 2716 females, and 279 still-born. The mortality in Edinburgh during the years 1845, 1846, and 1847 was respectively 3976, 4887, and 7026.

The mortality of Leith during the year 1848 amounted to 1281,—567 being males, 645 females, and 69 still-born. The mortality in Leith during the years 1845, 1846, and 1847 was respectively 544, 868, and 1031.

The mean temperature of the year was 46·73 degrees Fahr., being 0·67 of a degree below the mean temperature of 1847, and 2·67 degrees below the mean temperature of 1846. The annual range of temperature amounted to no less than 77 degrees, 83 being the highest, and 5 the lowest, as marked by the self-registering thermometer in the shade. The mean range of temperature was, however, 1·26 degrees lower than that of 1847. The mean pressure of the atmosphere, as indicated by the barometer, was 29·48 inches, being 0·14 of an inch below the mean barometric pressure in 1847, and 0·30 of an inch below that of 1846. The barometric range during 1848 amounted to 2·29 inches, 30·39 inches being the highest, and 28·10 inches the lowest noted during the year. The quantity of rain which fell amounted to 30·21 inches, being 8·39 inches greater than the fall of rain in 1847, but 0·47 of an inch less than what fell during 1846. West winds blew 138 days; east winds, 101½ days; south winds, 42 days; south-west, 30½ days; north-east, 18; south-east, 14; north-west, 11; and north, 10 days.

The meteorological peculiarities of the year 1848, as compared with 1847, therefore, consist in a lower mean temperature and lower mean range, combined with a greater annual range of temperature; a lower mean barometric pressure, combined with a greater range; an excess of atmospheric moisture, and a much greater fall of rain; a greatly increased prevalence of easterly and of southerly winds, and a marked diminution of northerly winds.

For the meteorological peculiarities of each month, reference may be made to the table appended to this report.

If the past year has exhibited peculiarities in its meteorological phenomena, it has not the less shown peculiarities in the diseases which prevailed in Edinburgh and Leith during its continuance. And the prevalence at different periods of the year of typhus fever, of scarlet fever, and of cholera, not only signalize the year as one peculiarly obnoxious to epidemics, but these have tended to increase the mortality of the year much beyond the average of former years.

Being anxious to supply as far as possible the want of a Registration Act for Scotland, and being desirous to ascertain the mortality in the chief towns of Scotland, in order to compare the mortality in them with that occurring in Edinburgh and Leith, some trouble was taken to procure as correct returns as possible from these towns. Bills of mortality are regularly drawn up and published for Glasgow by Mr Patrick, warden of the city burying grounds, under the able superintendence of John Strang, Esq., LL. D., the city chamberlain; for Paisley by the chamberlain, John Lorimer, Esq.; for Dundee by the chamberlain, William B. Baxter, Esq.; and for Greenock by John H. Tuelon, Esq. To these gentlemen, therefore, I am indebted for the mortality returns from these towns. No bills of mortality are prepared for Aberdeen, Perth, or Kilmarnock, but I have been favoured with extracts from the registers kept at the various cemeteries attached to these towns, which serve to give a general idea of the mortality prevailing there. In several other towns no record whatever is kept of the persons buried within their bounds, otherwise the subjoined table would have been more extended. For the mortality returns of the English towns I am indebted to the Registrar-General's Quarterly Reports for the year 1848.

The following table then shows the actual and proportional number of deaths in the several towns mentioned during the years 1845, 1846, 1847, and 1848, and the proportion of deaths in 1848 as compared with the population in 1841. As the year 1845, both in England and Scotland, approached nearer the average mortality than either 1846 or 1847, it is taken as the standard of comparison, and the towns are arranged in the order of least increase in 1848 as compared with that year.

I.—Table showing the proportional mortality of different towns in England and Scotland during the years 1845, 1846, 1847, and 1848 (excluding still-born).

Towns.	Mortality during 1845.	Mortality during 1846.	Mortality during 1847.	Mortality during 1848.	Increase per cent. in 1848 above deaths in 1845.	Ratio per cent. in 1848 with deaths in 1846.	Ratio per cent. in 1848 with deaths in 1847.	Proportion of deaths in 1848 to population of 1841.
1. Wolverhampton, ...	2,091	2,391	3,205	2,435	16·4	+ 1·8	— 31·2	1 in 38·1
2. England and Wales,	166,275	192,044	215,094	193,831	16·5	+ 0·9	— 10·9	1 in 34·1
3. London, ...	48,935	49,736	60,442	57,618	17·7	+ 15·7	— 4·9	1 in 33·8
4. Carlisle, ...	752	1,098	1,331	886	17·8	— 23·9	— 50·2	1 in 40·7
5. Manchester, ...	6,022	7,810	9,540	7,255	20·4	— 7·6	— 32·3	1 in 26·5
6. Liverpool, ...	7,371	9,713	17,271	9,442	28·0	— 2·8	— 82·9	1 in 23·6
7. Birmingham, ...	3,604	4,686	5,406	4,655	29·1	— 0·6	— 16·1	1 in 29·6
8. Paisley, ...	1,154	1,429	2,068	1,552	34·4	+ 8·6	— 33·2	1 in 38·9
9. Kilmarnock, ...	399	459	862	539	35·0	+ 17·2	— 53·2	1 in 37·0
10. Edinburgh,...........	3,668	4,594	6,706	5,475	49·2	+ 19·1	— 22·3	1 in 25·6
11. Dundee, ...	1,324	1,531	2,520	2,146	62·0	+ 40·2	— 17·4	1 in 29·2
12. Greenock, ...	788	1,087	2,214	1,289	68·5	+ 18·5	— 71·7	1 in 28·6
13. Glasgow, ...	7,509	10,854	18,081	12,475	66·1	+ 14·9	— 44·8	1 in 21·9
14. Aberdeen, ...	1,217	1,315	1,466	2,366	94·3	+ 79·9	+ 61·3	1 in 26·7
15. Perth, ...	389	505	683	921	136·7	+ 82·3	+ 33·3	1 in 20·9
16. Leith, ...	486	801	955	1,212	149·3	+ 51·3	+ 26·9	1 in 22·7

The + mark indicates that the mortality of 1848 had increased by the per centage noted above that of the year with which it is compared. The — mark that it had fallen below it. Thus the mortality of Paisley in 1848 was 8·6 per cent. *above* that of 1846, but 33·2 per cent. *below* that of 1847.

The above table shows one remarkable fact, and that is, that all the English towns suffered a much smaller increase in their mortality during 1848 above that of the standard year 1845 than any of the towns in Scotland. Thus, while the towns in England exhibited an increase to the extent of from 16 to 29 per cent., Paisley, which stands at the top of the list of the Scottish towns, exhibited an increase of no less than 34 per cent.; the mortality rising through the other towns till it arrives at Leith, in which the increase above 1845 amounted to no less than 149 per cent. But the above table still further shows, that all the English towns without one exception have, during the past year, fallen far below the mortality of the epidemic year 1847; while, on the other hand, in three towns of Scotland, viz. Aberdeen, Perth, and Leith, the mortality of 1848 has considerably exceeded that of 1847. Thus, in Leith the mortality in 1848 was 26 per cent., of Perth 33 per cent., and of Aberdeen no less than 61 per cent. above that of 1847. As the mortality in the English towns was the first to rise, and the first to subside, this observed fact seems to countenance the idea of a mortality wave (if it might be so termed) having passed over the island from south to north; the crest of the wave passing over the south of the island during the second quarter of 1847, reaching this part of the island during the last month of the fourth quarter of 1847, leaving it on the opening of the year 1848, and passing still further north, reached and passed over Aberdeen during the third quarter of 1848. Leith forms no exception to the general idea of this mortality wave, seeing that the greatly-increased mortality there during 1848 was caused by the advent of another mortality wave (the cholera in October) long after the other had left it.

In limiting the comparison, however, to the mortality of different years, we are apt to fall into an error with regard to the real state of healthiness of each town, unless we compare the mortality with the population. For several towns of Scotland there are no means of ascertaining with even an approach to accuracy the existing numbers of the inhabitants, seeing that great changes have occurred in the movements of the population since the taking of the last census, in consequence of the influx of Irish labourers for the railways, &c. This influx, as a deteriorating cause, has more especially affected small towns like Perth, where, to no small extent from this cause, the mortality rose from 389 in 1845, to 921 in 1848. The same cause has vitiated to a certain extent the calculations relative to several of the other towns of Scotland, notably of both Glasgow and Edinburgh; still, as we possess no other data than that furnished by the census of 1841, it must be taken as the basis of any calculations as to the proportion of deaths to the inhabitants. If the towns in the above table were therefore arranged in the order of least mortality among their inhabitants during 1848, as compared with the population of 1841, they would stand in the following order:—

1.	Carlisle, one death out of every	40·
2.	Paisley, ...	38·9
3.	Kilmarnock, ...	37·0
4.	England & Wales,	34·1
5.	London, ...	33·8
6.	Wolverhampton,	33·1
7.	Birmingham, ...	29·6

8.	Dundee, one death out of every ...	29·2
9.	Greenock, ...	28·6
10.	Aberdeen, ...	26·7
11.	Manchester, ...	26·5
12.	Edinburgh, ...	25·6
13.	Liverpool, ...	23·6
14.	Leith, ...	22·7
15.	Glasgow, ...	21·9
16.	Perth, ...	20·9

The average mortality in Edinburgh for the seven years, 1840 to 1846 inclusive (excluding still-born), amounted to 379 deaths annually, or one death out of every 35·3 inhabitants, according to the census of the population in 1841. During the last year, however, the proportion had increased to one death out of every 25·6 inhabitants; while, in 1847, it reached the frightful proportion of 1 out of every 20·9 of the population. In last year's report it was pointed out that the great increase in the mortality during 1847 arose from the prevalence and fatality of typhus fever among the immigrant Irish and low population of the town, —a disease which attained its height of severity and fatality on the outbreak of influenza in November of that year. The deaths, which in Edinburgh average 12 daily during the winter months, increased to 61 on the 30th of November 1847, and had only fallen to 20 deaths daily when the year 1848 opened. From that period, however, till the outbreak of cholera in October, the number of deaths steadily declined. Thus, during January, the deaths averaged 19·8 daily; during February, 18·6 deaths daily; during March, 15·1 deaths daily; during April, 13·0 deaths daily; during May, 11·7 deaths daily; during June, 11·7 deaths daily; during July, 9·3 deaths daily, or somewhat below the summer average of healthy seasons; during August, 10·0 deaths daily; and during September, 11·6 deaths daily. From the advent of cholera, however, the deaths rapidly increased. Thus, during October they averaged 16.6 daily; during November, 22·9 daily; but during December they again exhibited the tendency to decrease, by averaging only 18·9 deaths daily.

During the past year, the deaths from the zymotic (epidemic, endemic, and contagious) class of diseases amounted in Edinburgh to 2468, or formed 46·92 per cent. of the total mortality. In Leith, the deaths from the same class of diseases numbered 568, forming 46·86 per cent. of the total mortality. In this respect, then, Edinburgh and Leith have maintained an almost perfect uniformity. In 1846, the mortality from the zymotic class of diseases amounted both in Edinburgh and Leith to 24 per cent. of the total mortality; in 1847, however, the mortality therefrom in Edinburgh rose to 39 per cent., and in Leith to 29 per cent. of the total deaths. This great increase in the comparative mortality of the zymotic class of diseases, both in Edinburgh and Leith, during the past year, resulted from the prevalence in both places of typhus fever, scarlet fever, and cholera.

When the year opened, typhus fever may be said to have been the only prevalent epidemic, inasmuch as influenza was nearly gone, measles very rare, hooping-cough by no means frequent, and scarlet fever not then broken out as an epidemic. During January 1848, the mortality from typhus fever amounted to 209, having fallen from 334, which was the mortality of the same disease in December 1847, when influenza raged. From this date the mortality of typhus fever slowly but steadily declined; the deaths therefrom numbering 201 in February, 128 in March, 102 in April, 67 in May, 52 in June, 41 in July, 42 in August, 24 in September, 31 in October, 26 in November, and 42 in December. One conclusion from these facts seems clearly deducible, and that is, that, though the prevalence and fatality of typhus fever are fearfully aggravated by the presence of that peculiar condition of the air which gives rise to or attends the outbreak of influenza, the same disease does not appear to be at all influenced by the epidemic constitution of the air which gives rise to or attends either scarlet fever or cholera.

During the past year, 965 persons died of typhus fever in Edinburgh, and 127 in Leith, being in the proportion of 17·6 per cent. of the total deaths in Edinburgh, and 10·4 per cent. of the total deaths in Leith. Of the 965 persons dying in Edinburgh, 594 were males, and 371 females; thus showing a numerical preponderance of male cases, in consequence of the influx of Irish labourers to Edinburgh. In Leith, on the other hand, which is not subject to the same influences, the proportion of males and females was almost equal, 64 being males, and 63 females.

In last annual report it was pointed out that the typhus fever which had prevailed in Edinburgh during the greater part of 1847 was an imported disease; and various facts were referred to in proof of this position. It was also stated that from the month of October of that year it had assumed more the type of a regular epidemic. During 1848 it retained this character; and, instead of limiting its attacks to the immigrant Irish, and to the few native Scots with whom they came in contact, it attacked a large proportion of the lowest resident Scottish population. This changed character of the disease is rendered strikingly apparent by noting the varying proportions of Scots and of Irish admitted into the fever wards of the Royal Infirmary at different periods of the years 1847 and 1848, extracted from returns kindly furnished to me by Alex. M'Dougall, Esq., treasurer and superintendent of that valuable institution. Of 473 fever patients in the Royal Infirmary on the 10th of June 1847, no fewer than 379 were natives of Ireland,—but only 87 of Scotland, and 7 of England. On the 28th of September 1848, of 94 fever cases in that institution, 55 were natives of Scotland, only 35 of Ireland, and 4 of England.

On consulting the old mortality bills of Edinburgh for the last century, I find that the years in which virulent epidemics of fever prevailed were 1741 and 42, 1746, 1751, 1753–4–5 and 6, and then not again with any virulence till 1774 and 1775. After this the mortality from fever remained at a low figure till 1787, when it again broke out, attained its maximum in 1788, but did not very materially abate its ravages till 1793. Since that period Edinburgh remained comparatively free of great epidemics of fever till 1817, when it again broke out, and continued for a period of 3 years. A like epidemic re-appeared in 1826, and continued till 1829, also a period of 3 years. Typhus again broke out in 1843, and continued for about the space of one year; and this last epidemic which we have just witnessed broke out in March 1847, and continued till September 1848, a period of 18 months.

In the earlier part of last century the deaths from fever always constituted a large proportion of the annual mortality; and it is a somewhat remarkable fact, as connected with the history of the disease, that the absolute mortality of typhus fever was higher in 1741 and 1742 than during any of the epidemic years, 1788 to 1792 inclusive. This is the more worthy of note, seeing that in these latter years the population was nearly double what it was in 1741; the estimated population being about 40,000 in 1741, and 71,000 in 1790. These old mortality tables, in fact, point out the important fact that, in proportion as the habits of the people improved, in proportion as they lived on better fare and in loftier and better aired houses, and spread over a larger space of ground, typhus fever diminished among them.

A very different tale has to be told relative to the prevalence of typhus fever in Edinburgh during the present century; and it is worthy of inquiry what circumstances have led to the increasing ravages of that disease since 1817. Preliminary to this inquiry, however, it may be interesting to state the relative prevalence of typhus fever in Edinburgh during each of the epidemic periods from 1817 to 1849. The following statement, then, furnished to me by the Treasurer-Superintendent of the Royal Infirmary, shows the number of fever cases admitted into the fever wards during the various epidemics of typhus fever.

		Fever cases.		Fever cases.
Nov. 1817 to Nov. 1820, 3 years,	admitted	3090	—monthly average	83
Nov. 1826 to Nov. 1829, 3 years,	......	4318	......	119
Oct. 1836 to Oct. 1839, 3 years,	......	4850	......	134
May 1843 to May 1844, 1 year,	......	4568	......	380
March 1847 to Sept. 1848, 18 months,	......	7960	......	420

From this statement it is at once seen that typhus fever on every succeeding epidemic is becoming a more formidable and prevalent disease. What is the probable cause of this?

In 1817 the formation of the Union Canal was commenced, and the demand for labourers drew over large numbers from Ireland, many of whose families took up their permanent abode in Edinburgh. This, followed as it was by the building mania, drew over annually large additions of the same class of persons; and it was on their advent that the first severe epidemic of typhus fever, during the present century, made its appearance. At the same time the annual mortality suddenly increased, never afterwards to diminish. Thus, from 1800 to 1810, the mortality in Edinburgh was in the low proportion of one death annually out of every 39½ inhabitants; and, from 1810 to 1820, only one death occurred annually out of every 40 inhabitants. From the advent of these low Irish, however, the mortality has risen slowly and regularly during each decennial period up to the present day; the increase of the Irish, the increase of the general mortality, and the increase of fever, keeping pretty nearly equal pace with each other. The above table shows the increase of fever; and that the general mortality is on the increase, is apparent from the fact that, from 1820 to 1830, there died in Edinburgh one annually out of every 38 inhabitants; from 1830 to 1840 in the proportion of one death annually out of every 34½ inhabitants; while, from 1840 to the present day, such has been the increase in the general mortality that one death has occurred annually out of every 31½ inhabitants.

That this increased general mortality, and increased prevalence and fatality of epidemics of typhus fever, are almost solely to be attributed to the increase of that "great mass of suffering permanently included under the name of the Irish Poor," cannot for a moment be doubted by any one who has had an opportunity of visiting their abodes of wretchedness, overcrowding, and filth. By far the greater portion of the lowest class in Edinburgh is now composed of Irish; and the state of overcrowding, filth, and want of the necessaries of life amid which they live makes it surprising that typhus fever should ever leave their dwellings. Every succeeding year, therefore, calls more loudly for some stringent, but judicious and effectual legislative enactment, by which the sanitary condition of the lower classes may be improved. Every year this is delayed a heavier burden falls on the higher classes for the support of the families rendered destitute by the death or sickness of the parents; and, though an additional tax for carrying out sanitary measures would no doubt be felt somewhat oppressive at first, very few years would elapse before the lessened burdens of the poor's tax would make it apparent to all that the sanitary tax was indeed a real saving of money.

Scarlet fever began to exhibit a tendency to increase as early as the month of January, but the cases were scattered and comparatively few till June, when the disease began to assume the epidemic type, and became very prevalent. In Edinburgh the deaths from scarlet fever during June amounted only to 24, in August to 44, and in September to 78. It attained its height during October, when the deaths amounted to 130. From this period the disease began to decline, the deaths falling to 105 in November and to 79 in December. In Leith, again, the mortality from this disease was greatest in December, and next greatest in June and November, during which months the deaths were equal. The total deaths from scarlet fever in Edinburgh during the past year amounted to 530, being in the proportion of 9·6 per cent. of the total mortality, or one death out of every 264 of the population. In Leith the deaths amounted to 159, being in the proportion of 13·1 per cent. of the total mortality, or one death out of every 173 inhabitants. This disease was therefore, in proportion to the population, more prevalent and fatal in Leith than in Edinburgh.

It is a remarkable fact, as connected with the prevalence of scarlet fever, that during every severe epidemic of that disease, it seems to take the place of measles and hooping-cough, which during its continuance remain in more or less complete abeyance. This was remarked to be the case during the autumn and winter of 1835–36, when scarlet fever was last noticed as a ravaging epidemic in Edinburgh, and was strikingly observable during the past year. Scarlet fever differs in one very essential respect from measles and hooping-cough, that it only appears as a prevalent epidemic at rare and distant intervals, its annual mortality in ordinary years from sporadic cases being quite trifling. Thus, in 1846 and 47, during which measles and hooping-cough prevailed, the mortality from this disease was 12 in 1846 and 20 in 1847, a remarkable contrast with the fatality of the disease during the past year. As scarlet fever, however, has been abating during November and December, while measles and hooping-cough are again becoming more prevalent, we may hope that the disease will soon disappear.

Epidemic cholera was the third fatal disease which characterized the year 1848. As connected with this disease, it is necessary to mention, that within the limits of the Edinburgh and Leith Mortality Bills are included the fishing village of Newhaven, on the shores of the Frith of Forth, and the small village of Restalrig, situated in the midst of irrigated meadows.

Cholera broke out nearly simultaneously at Newhaven and Edinburgh, the first case occurring at Newhaven on the 1st of October, the first cases in Edinburgh on the 2d of the same month. On the 9th of October the disease appeared at Leith, but Restalrig had wholly escaped the disease when the year closed. At Newhaven the disease may be said to have terminated on the 28th of October,—after exactly a lunar month's continuance. At

Leith it terminated on the 2d of December, or almost exactly two lunar months after its outbreak; while in Edinburgh the disease continued, though the cases were few, when the year closed.

Only one case of cholera occurred at the small village of Restalrig in 1832; and as the disease had disappeared from all the surrounding villages without any of the inhabitants being seized, it seemed likely to escape the visitation altogether. On the 15th of January 1849, however, the disease suddenly broke out in that village, and within the space of three weeks seized about 30 persons, of whom 17 died. The population there does not exceed 150 souls, so that it gives the large proportion of one attacked out of every 5 persons, or one death out of every 9 of the population,—the largest proportion of which we have yet heard.

This is the second great epidemic of cholera in Edinburgh during the present century,—the first being in 1832. It is not to be supposed, however, that cholera has never been here since 1832. In the autumn and winter of 1833–34 we had another threatened outbreak, when many cases occurred, and a large proportion proved fatal. During the epidemic of 1833–34, the cases were almost entirely confined to the lowest class of the population; and what was worthy of remark was, that, while the persons living on the ground and attic floors were attacked, it almost invariably happened that those living in the intermediate floors escaped.

In 1832 cholera broke out in Edinburgh on the last week of January, and continued till the end of the first week of December. The following is the statement of the deaths during each of the months of that year, extracted from the Mortality Records:—

January, ...	2	August, ...	100
February, ...	9	September, ...	154
March, ...	58	October, ...	255
April, ...	145	November, ...	30
May, ...	85	December, ...	6
June, ...	62		
July, ...	154	Total,	1060

In 1832 the most efficient means were used by the Board of Health for the registration of every case, and it is generally believed that every case was registered. The Board reported 1062 deaths from cholera, and, as it is not possible now to ascertain how many were removed for burial beyond the bounds of Edinburgh, the fact of the numbers extracted from the Mortality Records corresponding so closely with those reported by the Board of Health, goes far to prove the general accuracy of these registers.

Having in last report (for September, October, and November 1848) noticed the chief peculiarities relative to the cholera as it appeared here, it seems unnecessary to repeat what was there stated. Edinburgh and the village of Loanhead presented some peculiarities or anomalies in the form of cholera which prevailed there, not noticed at Newhaven, Restalrig, Dumfries, or Glasgow. In all these latter places, while cholera was raging, cases of diarrhœa were extremely numerous, and when neglected many passed into cholera; and every case of cholera had the premonitory diarrhœa. Thus, at Newhaven, when cholera raged there, almost every inhabitant of the village suffered more or less from severe bowel complaint. The same occurred at Restalrig, Dumfries, and Glasgow; and numerous as were the cases of cholera, those of diarrhœa were many times more numerous. In Edinburgh, when cholera first broke out, diarrhœa was somewhat prevalent, and almost every case had premonitory diarrhœa; but after a short time diarrhœa became no more common than is usual during October, and those attacked with cholera were struck down suddenly with the disease, having had no premonitory diarrhœa. Such also was for the most part the case with those attacked at Loanhead,—a cleanly, well-aired village in a high and dry situation, about five miles to the south of Edinburgh, and containing about 1200 inhabitants, almost all in comfortable circumstances and comfortably lodged.

In Edinburgh, Leith, and Newhaven, the cases of cholera for the most part occurred in those districts of the town which were in the worst sanitary condition as to crowding, ventilation, and cleanliness; and at Restalrig the circumstance of the village being surrounded by meadows, irrigated with the foul water of Edinburgh, may perhaps have had some effect in rendering the inhabitants there more prone to diarrhœa and cholera. At Loanhead, however, everything was the reverse of this. The inhabitants first attacked, indeed, the majority of the cases occurred in persons in comfortable circumstances, living in the best and newest houses, which, as to cleanliness, &c. were unexceptionable in a sanitary point of view. Yet cholera broke out among them most unexpectedly and virulently, and within six weeks from the 3d of November 61 cases had occurred, of which 46 proved fatal. This gives 1 case out of every 19 inhabitants, and 1 death out of every 27 inhabitants. After the disease had apparently exhausted its virulence on the inhabitants in the better part of the village, it extended its ravages to those living in the poorer parts, where, however, it limited its ravages chiefly to the dissipated, who lived in dwellings much in need of purification. At Loanhead, as at Newhaven, the attack of cholera as an epidemic was limited to one month from its outbreak. It broke out on the 3d of November, and ended on the 2d of December. One case occurred a fortnight afterwards, and again in the neighbourhood of the village about a month after that again, but the cases then were unquestionably cases of the communication of the disease by contagion. It has always been remarked, as one of the peculiarities of cholera, that the dissipated were its especial victims; and this circumstance may perhaps so far explain the attacks at Loanhead. The inhabitants are generally dissipated, and many very irregular in their habits, and it was among these chiefly that the disease occurred. Nevertheless, this will not altogether explain the occurrences there, seeing that instances occurred where the more sober wife was cut off, while the drunkard husband escaped. This, however, was one of the peculiarities of the disease, to attack females in preference to and in greater numbers than males. For these and many other important particulars relative to the cholera at Loanhead, I am indebted to the Rev. William Anderson of Loanhead, who, in the discharge of his ministerial duties, attended almost every case.

Though cholera, when it first broke out, did not in general manifest itself as a contagious disease, it certainly did so in several unquestionable instances later in the epidemic. Several very marked and striking instances of this occurred both in Edinburgh and near Loanhead, after the disease was dragging out a languishing existence in Edinburgh, and had ceased for weeks at Loanhead. Individuals and families flying from the cholera in Dumfries and Glasgow, after one of the members of the family had died of the disease, took up their abode in Edinburgh and near Loanhead, and communicated the disease to those with whom they lodged, though at the moment none of the fugitives were labouring under the disease.

During the former epidemic of cholera, it was remarked by many physicians in different parts of Europe that, during its continuance, the mortality from all other diseases was greatly diminished. I know not whether these statements were founded on actual statistical returns,—if not, they are of no value. This, however, is certain, that in Edinburgh, during the former epidemic, and in Edinburgh, Leith, and Glasgow, during the present epidemic, the general mortality of all diseases, instead of being lower, has been above the average during the continuance of the epidemic. Thus, the average annual number of deaths in Edinburgh for the three years preceding the outbreak of cholera in 1832, was 3465 deaths. During the year when cholera prevailed they rose to 5262 deaths, only 1062 of which were attributable to cholera, leaving an excess in the general mortality of all other diseases to the extent of 735 deaths. In Leith, during the past year, during the two months when cholera prevailed, the mortality from the ordinary diseases was quite excessive. Thus, during October and November of the standard year 1845, the whole mortality amounted to 87 deaths; during October and November 1848, whilst cholera prevailed, the total mortality amounted to 396 deaths, of which only 181 were attributable to cholera; leaving an excess of 128 deaths over the total mortality of October and November 1845. In Edinburgh the total mortality during October, November, and December, of the standard year 1845, amounted to 981 deaths; during the corresponding months of 1848, while cholera prevailed, the total deaths amounted to 1790; of these only 366 were attributable to cholera, leaving during these three months an excess of 443 deaths above the mortality of the corresponding months of the standard year 1845. The same fact is proved if we view the subject in another light. Before cholera appeared, the mortality in Edinburgh was falling to the low standard of 1845. Thus, the deaths from the ordinary diseases, excluding the whole zymotic class, averaged 6·6 daily during July, 6·2 daily during August, and 6·6 daily during September; but, on the outbreak of cholera in October, they rose to 7·2 daily, during November to 9·6 daily, and during December to 7·4 daily. The same was true of Glasgow. During November and December, when cholera raged, the total mortality amounted to 3374 deaths, of which number 1420 were attributable to cholera, leaving 1954 deaths from ordinary causes. If we deduct the aggregate total mortality of the two previous months, it will leave an excess of deaths from ordinary causes, during the months when cholera prevailed, of 447; even allowing 100 additional deaths during December, the excess of deaths from ordinary causes will, during the cholera period, amount to 347. As the very same facts were noticed, even to a more striking extent, during the continuance of epidemic typhus fever last year, it may be regarded as established, that the mortality from these great epidemics is superadded to the general mortality, which, during their continuance, is also increased—not diminished, as heretofore was very generally believed. On the other hand, these great epidemics appear to render those who recover from them more liable to be affected afterwards with the ordinary diseases; and thus the general mortality is kept above its natural standard for months even after the pestilence has entirely ceased its ravages. Thus, in 1833 the mortality in Edinburgh was still 800 above its natural standard, though cholera had ceased the year previous. And many similar facts might be quoted. Every effort should therefore be made to arrest the progress of these epidemic diseases, which seem every day to be more and more on the increase.

These three diseases, then, typhus fever, scarlet fever, and cholera, were the chief agents in raising the mortality of the past year so much beyond the average mortality of former years. It is to be hoped that the epidemic period has now passed from us, and that Edinburgh will revert to its pristine healthfulness.

Of the other epidemic diseases, small-pox cut off 96 in Edinburgh during the past year, of which number 8 were reported to have been previously vaccinated, and 88 not protected by vaccination. Only 5 deaths from the same disease occurred in Leith during the past year, all unvaccinated. The deaths from this disease, before the introduction of vaccination, always constituted in Edinburgh a large per centage of the mortality, almost always equalling the combined mortality of measles and hooping-cough. Thus, from 1740 to 1750, the deaths from small-pox constituted nearly 14 per cent. of the total mortality; from 1750 to 1760 it was 9 per cent. of the total deaths; 11 per cent. from 1760 to 1770; 12 per cent. from 1770 to 1780; 14 per cent. from 1780 to 1790; and 12 per cent. from 1790 to 1800, when vaccination was introduced. Immediately on the introduction and general adoption of vaccination, the proportional number of deaths from small-pox fell, so that from 1800 to 1810, the mortality from that disease formed only 3½ per cent. of the total deaths, and the proportion continued to sink lower and lower, so long as the greater proportion of those born were vaccinated. Thus, from 1810 to 1820, the deaths from small-pox formed only 1·5 per cent. of the total deaths; and from 1820 to 1830 were so low as 1·2 per cent. From that date, in consequence of the general neglect of vaccination among the lower classes, the deaths from small-pox have been on the increase. Thus, from 1830 to 1840, they formed 1·9 per cent. of the total deaths, and from 1840 to 1849, they have increased to 2 per cent.; and a rather virulent epidemic of small-pox is at this moment raging among us.

Measles and hooping-cough, the diseases usually prevalent among children, in ordinary years cut off from 300 to 400 children annually. During the past year, however, these two diseases together proved fatal to only 149 children; the majority of the cases occurring before the outbreak of scarlatina, and after that disease began to decline.

During the present century the proportional mortality of measles has greatly diminished, notwithstanding that it is the general belief that the arrestment of small-pox by vaccination allowed a larger proportion of children to become the victims of measles, scarlet fever, and hooping-cough, and consequently that the mortality from these diseases was greater than before the introduction of vaccination. To ascertain this point, the deaths from measles in Edinburgh during a portion of last century were extracted from the Bills of Mortality, and the following is the result. From 1740 to 1750 the mortality of measles was 5·6 per cent. of the total deaths. From 1750 to 1760 it was 6·1 per cent. From 1760 to 1770 it was only 2·3 per cent.; and from 1770 to 1780 it was 11·8 per cent. During the present century, we have only correct tables of the diseases in Edinburgh drawn up from 1839 to 41 inclusive, and from 1846 to 48 inclusive. During the first of these periods the deaths from measles formed 2·9 per cent. of the total mortality; while from 1846 to 1848 inclusive, they formed 2·6 per cent. of the total deaths. From these simple statements may be inferred the benefits which vaccination has conferred on the community, inasmuch as the almost complete arrestment of a disease which annually cut off 12 per cent. of all persons dying in Edinburgh, has not tended to increase the fatality of other diseases.

Hooping-cough during the past year proved fatal to only 94 children in Edinburgh, and 22 in Leith, 45 of these being males, and 71 females. This disease, though its proportionate mortality has somewhat decreased during the present century, has more nearly than measles retained the average it had during the past century. Thus, from 1740 to 1750, hooping-cough constituted 5·8 per cent. of the total deaths; from 1750 to 1760 the proportion was 4·9 per cent.; from 1760 to 1770 it was 4 per cent.; from 1770 to 1780 it was 4·8 per cent.; and from 1780 to 1790 the deaths from hooping-cough amounted to 4·2 per cent. of the total deaths. During the past three years, the deaths from the same diseases have formed only 3·7 per cent of the total deaths.

Croup proved fatal to 51 persons in Edinburgh, and to 18 in Leith, during the past year—34 being males, and 35 females. This disease has therefore been much less prevalent in Edinburgh, but more prevalent in Leith during the past year, than in 1847. In 1847, the deaths from croup amounted in Edinburgh to 89, so that 37 fewer have died of the disease during the past year.

Ague proved fatal to two individuals during the past year, both reported to have contracted the disease abroad. However rare ague now is in Edinburgh, it was at one time one of the regular endemic diseases, not a year passing over without its cutting off several victims. Before the drainage of Hope Park (formerly a shallow lake or marsh), in the year 1722, often so many as 30 deaths in a year occurred from ague; and even so late as 1752, the year before the improvements under the auspices of Provost Drummond began, no fewer than 14 died from this disease. The deaths from ague gradually fell after this year to the year 1762, when four died of this disease; and the drainage of the North Loch the next year, though not very perfectly done, may be said to have put an end to the disease in Edinburgh. Cases of ague, however, now and then occurred after this, both in the neighbourhood of the North Loch and of Hope Park; but from the drainage of the North Loch in 1763, till the end of the century, only 10 deaths are recorded as being caused by ague.

In taking a general view, then, of the mortality from epidemic and endemic diseases in Edinburgh during the past and present centuries, we at once see how much has been effected by improvements in the dwellings, drainage, and modes of living of the inhabitants. And if we now see that, since the advent of the low Irish and their increase among us, typhus fever and other epidemics are on the increase, we have only to look back to the end of last century, and commencement of this, to satisfy ourselves how much may be done for their arrestment, by following out sanitary improvements. It is true, that the measures now needed would require to be somewhat different from those in former times; but it is to be feared that nothing will be found effectual till a stop is put to the now regular immigration and settlement of the low Irish in all our towns.

Diseases of the brain cut off fewer persons during the past year than during either 1846 or 1847. The mortality of this class of diseases amounted to 482 in 1846, to 516 in 1847, but only to 882 in 1848. Of these diseases, hydrocephalus was the most fatal during 1848, cutting off 113 persons, 59 being males and 54 females; 62 died from apoplexy in Edinburgh, 44 males and 18 females,—a much larger proportion of males than during either 1846 or 1847; 93 deaths were ascribed to paralysis, 43 being males and 50 females.

The mortality of diseases of the respiratory organs has been greatly less during the past year than during either of the previous years. Bronchitis and pneumonia have been much less prevalent during 1848 than during either 1846 or 1847. These diseases attained their maximum mortality during the year 1847, when scurvy and influenza were prevalent; indeed, these diseases appeared to aggravate the mortality of all diseases of the respiratory organs. Thus, during 1848 the deaths from bronchitis amounted to 16, from pneumonia to 126, from asthma to 66, and from consumption to 533; whereas during the year 1847 the deaths from these diseases were respectively 113, 246, 118, and 799.

By the old mortality bills of Edinburgh we learn that consumption was a much more fatal disease during the last century than it is at the present day. This may be easily accounted for. Then the town was confined to that portion now termed the "Old Town," with its crowded and very narrow streets and lanes, its towering houses, its confined and ill-ventilated apartments, its complete want of drainage, and the want of innumerable comforts and conveniences which all ranks now enjoy. Thus, from 1740 to 1750, consumption cut off annually 19·3 per cent. of all persons dying in Edinburgh. From 1750 to 1760 it constituted 19·1 per cent. of the total mortality. From 1760 to 1770 it constituted 20·7 per cent. of the total deaths; 27 per cent. from 1770 to 1780; and 26·4 per cent. of all persons dying in Edinburgh from 1780 to 1790. During the past three years, 1846, 1847, 1848, the proportion of deaths from consumption has been only 11·7 per cent. of the total deaths in Edinburgh, and so low as 9·9 per cent. in Leith. If again we take the proportion of the population cut off annually by this disease during the past and present centuries, we shall arrive at the same conclusion as to the excessive prevalence of the disease during the past century, as compared with what it now is. Thus, according to the corrected returns of the population for the past century, consumption in Edinburgh from 1780 to 1790 proved fatal to 1 annually out of every 125 of the population, whereas, notwithstanding the excessive fatality of this disease here during 1847, there died in Edinburgh during the last 3 years at the rate of 1 annually out of every 213 inhabitants. In other words, the deaths from consumption during the last 3 years were 78 per cent. fewer in Edinburgh than during the latter part of the last century. In Leith again, during the last 3 years the deaths from consumption were so low as 1 annually out of every 280 inhabitants. The above facts, taken in connection with the diminished mortality from epidemic diseases, proves in a very satisfactory manner the great improvement in the public health, which has resulted, not from the advancement of medical science, but from the increasing comforts in food, clothing, habitations, &c., which result from the progress of civilization. In proportion to our progress in civilization and departure from a state of rude barbarism, plagues diminished, then ceased; and the mortality from epidemic diseases and consumption fell lower and lower,—almost holding out the hope that, should we succeed in advancing in civilization, and effecting those sanitary improvements which the enlightenment of the age shows to be necessary, we should succeed in still further controlling these fatal maladies.

The mortality from diseases of the heart and blood-vessels was lower during last year than during either of the two preceding years, amounting to 85 only; whereas it amounted to 100 in 1846, and to 114 in 1847. In Leith the mortality of heart disease, &c. was exactly the same in amount as in 1846, viz. 14 deaths; whereas in 1847 the number of deaths amounted to 27.

Diseases of the organs of digestion, excluding the epidemic and endemic bowel complaints, amounted in Edinburgh to 562 during the past year, being 36 fewer than in 1847, but 69 more than in 1846. The deaths from inflammation of the stomach and bowels amounted to 246 in 1848; whereas in 1847 they were 206, and in 1846 only 120. The increased tendency to bowel complaints which prevailed in 1848 sufficiently accounts for the above increase.

One of the most remarkable facts connected with the mortality of the past year, is the great decrease in the number of deaths registered in Edinburgh under the head of old age. In 1846, 540 deaths were registered under that head; 617 in 1847; but only 367 in 1848. That this great decrease was not caused by the aged being cut off by other diseases, and being consequently registered under another head, is proved by the fact, that fewer persons above 60 years of age died during 1848 than during either 1846 or 1847. Thus, in 1846 there died 943 persons above 60 years of age, in 1847 no fewer than 1259 persons, but in 1848 only 750 persons. This diminished mortality of the aged during the past year may have arisen from two causes: 1*st*, That influenza in 1847 cut off in especial the aged, and among them many who in ordinary seasons would have survived a year or two. 2*d*, That the greater uniformity of temperature during 1848, more especially the less sudden changes of temperature during the latter half of the year, the lower barometric pressure, and moderate moisture of the atmosphere, during all which states it has been observed that the mortality among the aged is diminished, may have contributed to produce this result.

Having thus noted the leading diseases which prevailed during the past year, a few remarks may be appended on the proportion of persons dying at different ages during the past and present centuries, as this will exhibit in a striking point of view the improvement which has been effected in the public health during the present century.

It is a known fact, that in an unhealthy town or locality the infantile mortality bears a much larger proportion to the total deaths than in a healthy one. It may, therefore, be stated as a general rule, that the less the proportion of deaths among children under 5 years, the greater is the healthiness of the town or locality. Numerous instances proving this might be adduced. Thus, while over England and Wales the proportion of deaths among children under 5 years of age is, on an average of several years, about 36 out of the 100 deaths at all ages,—the proportion rises to 47 in Glasgow and Birmingham, to 49 in Manchester, and to 52, out of the 100 deaths at all ages, in Liverpool, one of the most unhealthy towns in Britain. The following table then exhibits the per centage of deaths in Edinburgh at different ages during two periods of last and two periods of the present centuries.

Ages.	1740 to 1750	1780 to 1790	1839, 40, 41	1846, 47, 48
Under 2 years, ...	35·2	33·4	25·0	24·4
2 to 5 years, ...	12·2	11·6	8·5	8·1
Total under 5 years,	47·4	45·0	33·6	32·5
5 to 10 years,	4·3	5·9	5·1	4·6
10 to 20 years,	4·1	5·0	5·1	5·8
20 to 60 years,	29·8	26·1	35·6	39·3
Above 60 years,	14·2	17·6	20·4	17·6

From the above table it is at once apparent that infantile mortality has been much less during the present than it was during the past century; for while of 1000 persons born from 1740 to 1750, no less than 352 died before they attained their 2d year, only 244 died under the same age from 1846 to 1849. The same fact is evidenced by taking the proportion of all those dying under 5 years of age. A century ago, very nearly a half, or 474 out of every 1000, died before they attained their 5th year; whereas during the last few years the 30th year of life is attained before an equal number are cut off, and only 325 out of every 1000 born are cut off before they attain their 5th year. In fact, Edinburgh a century ago was just about as unhealthy as Liverpool now is. As a natural consequence of the lessened mortality in infancy and childhood during the present century, more are spared to die in manhood and old age; consequently, between the ages of 20 and 60 years, instead of the mortality being in the proportion of from 261 to 298 deaths out of every 1000 deaths at all ages, as it was last century, the mortality at the same ages during the present century reaches the large proportion of from 356 to 393 out of the 1000 deaths at all ages.

A few remarks will now be made on the mortality of the other towns in Scotland, from which returns have been received.

The returns from Glasgow, Paisley, Dundee, and Greenock, specify the diseases as well as the sex and age of all persons dying in these towns during the year 1848. Some of the Aberdeen returns, but not the whole, specify the same facts; while from Kilmarnock and Perth, the returns are confined to the numbers of males, females, and still-born. The following tables exhibit, at a glance, the numbers dying at different ages in the towns of Glasgow, Paisley, Dundee, and Greenock, during the year 1848; also the numbers cut off by a few of the more prevalent and fatal diseases in these towns.

Table of Ages for 1848.

Ages.	Glasgow.			Paisley.			Dundee.			Greenock.		
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot	M.	F.	Tot.
Under 1 year	940	789	1729	86	93	179	171	102	273	101	77	178
1 & under 2	618	549	1167	68	75	143	100	89	189	45	48	93
2 ... 5	828	666	1494	107	88	195	202	161	363	49	48	97
5 ... 10	477	365	842	68	52	120	102	97	199	37	28	65
10 ... 15	169	168	337	28	21	49	70	73	143	19	9	28
15 ... 20	249	245	494	29	35	64				26	27	53
20 ... 30	645	690	1335	61	47	108	66	90	156	65	69	134
30 ... 40	630	656	1286	48	65	113	67	92	159	71	58	129
40 ... 50	644	599	1243	69	74	143	92	97	189	84	66	150
50 .. 60	492	419	911	52	52	104	72	77	149	57	54	111
60 ... 70	365	419	784	67	59	126	65	72	137	42	45	87
70 ... 80	301	301	602	47	71	118	40	54	94	39	36	75
80 ... 90	93	132	225	18	25	43	26	40	66	10	26	36
90 and upwards	8	18	26	0	4	4	0	2	2	0	0	0
Not specified	...	..	...	21	22	43	...	...	...	25	28	53
TOTAL DEATHS	6459	6016	12475	778	774	1552	1073	1046	2119	670	619	1289
Still-born	416	288	704	50	28	78	57	45	102	...	...	65
TOTAL	6875	6304	13179	828	802	1630	1130	1091	2221	...	..	1354

The tables of ages for the above towns will be rendered more easily comparable with one another, and with that already given for Edinburgh, if the mortality at each age be reduced to the proportion it bears to the 100 deaths at all ages. The following table, then, exhibits the proportional deaths at each age, to the 100 deaths at all ages during the year 1848 :—

Ages.	Glasgow.	Paisley.	Dundee.	Greenock.
Under 2 years,	23·2 p. cent.	21·3 p. cent.	21·8 p. cent.	21·9 p. cent.
2 to 5 years,	11·9	12·8	16·6	7·8
Total under 5 years,	35·1	34·1	38.4	29·7
5 to 10 years,	6·7	7·9	9.3	5·2
10 to 20 years,	6·6	7·4	6·7	6·5
20 to 60 years,	38·2	31·0	30·8	42·4
Above 60 years,	13·1	19·2	14·1	15·2

The above table shows that infant mortality under two years of age was higher in Glasgow than in any of the other towns, amounting to 23·2 children out of every 100 persons dying at all ages. Children between the ages of two and five years died during the last year in a greater proportion at Dundee than in any other of the above towns, while the mortality among children of the same age was least in Greenock, the proportion not being half so great as at Dundee. It will be afterwards shown, that this great excess of deaths at Dundee, of children between the ages of two and five, was caused by the excessive prevalence in that town of scarlet fever. In consequence of this excessive mortality between the ages of two and five years at Dundee, the proportional mortality of children under five years of age was higher at Dundee than any of the other of the above towns, the deaths under five years of age being in the proportion of 38·4 to the 100 deaths in all ages. Glasgow was next highest, the mortality under five years of age being in the proportion of 35·1 to the 100 deaths at all ages, while the mortality in Paisley was 34·1, and in Greenock 29·7 per cent. only. The proportion dying between the ages of 20 and 60 years was highest in Greenock, where the infantile mortality was lowest, amounting to 42·4 per cent. of the total deaths; and lowest in Dundee, where the infantile mortality was highest, amounting there to 30·8 per cent. of the total deaths. The proportion of deaths above 10 was highest in Paisley, and lowest in Glasgow.

Table of principal Diseases—1848.

Diseases.	Glasgow.			Paisley.			Dundee.			Greenock.		
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.
Aged,	383	492	875	85	120	205	53	88	141	46	63	109
Asthma,	115	133	248	3	12	15	26	25	51	7	13	20
Bowel complaints,	643	594	1237	107	67	174	98	66	164	53	65	118
Brain disease,	347	248	595	35	31	66	89	67	156	19	11	30
Cholera,	666	754	1420	1	2	3	2	1	3	2	1	3
Consumption, decline,	1104	1007	2111	146	150	296	107	111	218	83	107	190
Dropsy,	161	174	335	22	23	45	37	55	92	10	15	25
Hooping-cough,	153	177	330	20	23	43	22	13	35	8	8	16
Measles,	177	145	322	27	12	39	41	39	80	2	2	4
Scarlet fever,	251	223	474	31	47	78	164	144	308	2	0	2
Small-pox,	167	133	300	27	23	50	47	44	91	12	11	23
Typhus fever,	773	614	1387	117	97	214	175	181	356	197	147	344

The above tables of diseases show that, during the past year, Glasgow, Paisley, and Dundee have been overrun by the same epidemic diseases as Edinburgh,—cholera excepted, which had just made its appearance in Paisley and Dundee when the year closed. Greenock, on the other hand, appears to have been under very different influences from most other towns of Scotland, and to have almost quite escaped the ravages of these diseases. Thus, scarlet fever, which has been very prevalent and fatal at Aberdeen, Edinburgh, Leith, Glasgow, Paisley, and Dundee, has passed over Greenock altogether. In these towns, however, the fatality of that disease has varied greatly. From the partial returns of diseases received from Aberdeen, the mortality from scarlet fever appears to have been very high. At Dundee the mortality of scarlet fever amounted to 14·5 per cent. of the total mortality, in Leith to 13·1 per cent., in Edinburgh to 9·6 per cent., in Paisley to 5 per cent., and in Glasgow to 3·7 per cent. of the total deaths.

If Greenock suffered least from scarlet fever during the past year, it suffered most from typhus fever, the mortality therefrom exceeding a fourth of the total deaths, being in the proportion of 26·6 per cent. of the total deaths. In Edinburgh the proportion of deaths from this disease was 17·6 per cent.; in Dundee, 16·7 per cent.; in Paisley, 13·7 per cent.; in Glasgow, 11·1 per cent.; and in Leith, only 10·4 per cent.

The mortality of small-pox, which formed a scarcely calculable fraction of the total mortality in Leith, was so high as 4·2 per cent. of the total deaths in Dundee during the year 1848; 3·2 per cent. of the deaths in Paisley; 2·3 per cent. in Glasgow; 1·7 per cent. in Greenock; and 1·6 per cent. in Edinburgh.

Greenock, which escaped the ravages of scarlet fever, was nearly equally fortunate in respect of measles. In no town of Scotland has the mortality of measles been high during the year, excepting perhaps Dundee, where the deaths from measles amounted to 3·7 per cent. of the total deaths. In Glasgow and Paisley they were only 2·5 per cent., in Edinburgh 1·0 per cent., and in Leith so low as 7–10ths of a per centage.

The mortality of hooping-cough has been unusually low in every town during the past year. In Paisley the deaths from hooping-cough amounted to 2·7 per cent. of the total mortality; in Glasgow to 2·6 per cent., in Leith to 1·8 per cent., in Edinburgh to 1·7 per cent., in Dundee to 1·6 per cent., and in Greenock they were as low as 1·2 per cent. of the total deaths.

Probably, in consequence of the exceeding prevalence of scarlet fever in Dundee, and its frequent consecutive dropsy, the mortality from dropsy, instead of only amounting to 2·6 per cent. of the total deaths, as in Edinburgh and Glasgow, was as high as 4·3 per cent. In Paisley the mortality of dropsy amounted to 2·8 per cent., in Greenock to 1·9 per cent. while in Leith it was as low as 1·1 per cent. of the total deaths.

Cholera, when the year closed, had just made its appearance at Dundee, Paisley, and Greenock. In Glasgow, however, it had been raging for about 7 weeks, and was very prevalent and fatal when the year closed—indeed, it had not then attained its acmé. At the close of the year it had cut off 1420 persons, and formed no less than 11·3 per cent. of the year's mortality. In Edinburgh it formed 8·7 per cent., and in Leith 15·2 per cent. of the total deaths of the year. In Glasgow, as in Edinburgh and Leith, females were cut off by cholera in larger numbers than males. Of the 1420 deaths, 666 were males and 754 females.

The cholera in Glasgow was almost invariably attended with premonitory diarrhœa; and during the whole course of the epidemic, common diarrhœa and rice water purgings were exceedingly general. Even when the disease was on the decline, the same fact was noticed. Thus, there were reported to the Board of Health from the 29th to the 31st of January 1849, 141 cases of cholera, and 609 cases of diarrhœa in 37 of which were rice water purgings. From the 1st to the 4th of February 1849, there were reported 141 cases of cholera, and 576 cases of diarrhœa in 30 of which rice water purgings occurred. It was when the disease showed this tendency to commence by diarrhœa, that the house-to-house daily visitation, and the correcting this premonitory diarrhœa, seemed, in the estimation of many, to be so efficacious in moderating the virulence of the disease.

That these measures had this effect does not appear to rest on sufficiently satisfactory data, seeing that the gradual subsidence of the disease may have depended as much on the natural progress of the malady as on the preventive and remedial measures employed. Thus, the house-to-house visitation in Glasgow was commenced in the early part of the Christmas week, when the number of cases, as reported by the Board of Health, numbered 87 on the Monday and 84 on the Tuesday of that week; yet the number of cases increased daily from that date up to the 5th of January, on which day 239 cases were reported. Even on the 9th of January the cases of cholera numbered 163, or were double the number they had been when the house-to-house visitation was commenced, and after it had been in full operation for nearly a fortnight! That this practice saved some lives seems undoubted; but the facts by no means warrant the assertion that the disease was thereby materially arrested.

In confirmation of the opinion advanced, that the subsidence of the cholera in Dumfries and in Glasgow was owing to the natural progress of the malady, and not to the preventive measures employed, the following facts may be adduced. In all places in Scotland from which I have been able to procure special returns, when cholera was severe it either confined its ravages within a month, or if it continued with any degree of severity beyond that period, it attained a maximum or maxima of severity, at the end of every monthly period from the date of its outbreak until it reached its acmé, and generally terminated at the end of a monthly period. In fact, this disease appeared to be as much under monthly influence as the menstrual function in women.

In Edinburgh the cholera attained its maximum of severity first on the completion of the 4th week from its first appearance; and secondly, it attained a second maximum on the completion of the 8th week from its outbreak. It appeared in Edinburgh on the 2d of October, and attained its first maximum on the 28th of the same month, on which day 20 cases were reported. After this it gradually declined till the 29th day of November, on which day 6 cases were reported, this number being the daily average of the previous week. On the 30th, however, the cases again rose suddenly to 18, thus constituting the second maximum which the disease attained here. In Edinburgh, it is to be borne in mind that, as the cholera was not in general attended with premonitory diarrhœa, house-to-house visitation was uncalled for. The disease was allowed to progress or abate unchecked. The phenomena, therefore, regarding its attaining a maximum of intensity on any particular day, may be regarded as the natural phasis of the disease.

In Leith the same phenomenon was observed. Cholera broke out there on the 9th of October, and attained its maximum on the 6th of November, exactly a lunar month after its outbreak, when the cases numbered 18. On the 9th of November, however, exactly a calendar month from its first appearance, the cases numbered 19, or one more than on the 6th. The disease wholly disappeared just before the completion of the 8th week from its outbreak.

At Loanhead cholera broke out on the 3d of November, and ceased as an epidemic within one month from its outbreak. The disease in this village was very severe.

At Newhaven cholera broke out on the 1st of October, and the last case occurred on the 28th of the same month,—exactly a lunar month after its appearance. Here also the disease was very severe.

In Glasgow a similar aggravation of the disease was observed at much the same periods from its outbreak. Cholera first appeared in Glasgow on Sunday the 12th of November, and the disease maintained a languishing existence till the 11th of December, on which day only 3 cases were reported. On the 12th of December the cases rose to 11, and the next day to 22. Here the first maximum was attained just one calendar month from its outbreak. After this the disease rapidly extended; and, notwithstanding every effort which human skill could devise for its arrestment, steadily advanced till it attained its second and real maximum on the 5th of January 1849, almost exactly two lunar months from its outbreak.

As far as I have been able to learn regarding the progress of the cholera at Restalrig and Coatbridge, it appears to have confined its ravages within the month from its outbreak.

At Kelso the first case of cholera occurred on the 27th, the second on the 30th of November, but cases did not occur continuously till the end of the first week of December. The first maximum of the disease was attained on the 2d of January, when 12 cases were reported; the second maximum was reached on the 28th of the same month, when 10 cases occurred.

At Dumfries cholera attained its maximum on the 11th of December, when 38 cases were reported, as nearly as I can learn within a lunar month from the occurrence of the first case. The disease wholly terminated within two lunar months from its outbreak; the last case, so far as I have been able to learn, having occurred on the 10th or 11th of January 1849.

In almost all these cases, then, we see that the cholera, in its duration and accesses, has maintained a certain periodicity; and if we find that in some cases that period has been a day or two before the exact lunar month, or a day or two behind it, it is no greater deviation than what is every day observed with the menstrual function in women. Can this peculiar phasis of the disease have had any thing to do with the observed greater prevalence and mortality of cholera among women? (See Report for September, October, and November 1848).

In making these remarks, it is not intended to throw any disparagement on the excellent preventive measures adopted in Glasgow and Dumfries, but merely to show that, in so far as the facts go, they do not appear to warrant the conclusions which have been so generally drawn from them; and it is both unphilosophical and unwise to jump at a conclusion, however agreeable it may be to our preconceived notions, unless the facts on which that conclusion rests are incontrovertible, and admit of no other conclusion being arrived at.

The only other disease which it seems necessary to notice in connection with the above Scottish towns is consumption. In all those towns, excepting Edinburgh and Leith, tabes mesenterica, or decline, is included under the term consumption; but this will not vitiate the comparison of the proportionate mortality in those towns, as all use the same classification of disease; neither can it lead to error in a medical point of view, seeing they are both but different forms of tubercular disease.

Of all the Scottish towns, the mortality from consumption during the past year was lowest in Dundee, amounting to only 10·2 per cent. of the total deaths. Even if all the deaths classified under the term, "disease of chest," were added, the mortality from these complaints would only amount in Dundee to 13·0 per cent., a proportion for chest diseases far below that of every other Scottish town. Neither is the above proportion of deaths by consumption a causual occurrence, but Dundee maintains its pre-eminence in this respect, year after year. Thus, in 1845 the deaths from consumption in Dundee formed only 11·9 per cent. of the total deaths; in 1846 they formed 12·4 per cent., and in 1847 they amounted to 10·7 per cent. of the total deaths. Dundee, then, in so far as consumption is concerned, is a very healthy place, notwithstanding its manufactories, &c.; and the cause of its freedom from this bane of the human race, even among its manufacturing population, is well worthy of a careful investigation.

The proportion of deaths from consumption (including tabes) during the past year in Edinburgh was 12·0 per cent. of the total deaths; in Greenock, 14·7 per cent.; in Leith, 15·2 per cent.; in Glasgow, 16·9 per cent.; while in Paisley, not even including the deaths from consumption above 60 years of age, the proportional mortality was so high as 19·0 per cent. of the total deaths. If the deaths from consumption above 60 years of age were added, the mortality of that disease in Paisley would amount to no less than 20·7 per cent. of the total deaths. This is indeed a fearful mortality in Paisley, far exceeding that of any other disease during the past year. Neither is it a casual mortality, occurring like epidemics at long and distant intervals, but regular from year to year. Thus, notwithstanding the excessive mortality there from typhus fever, in 1847 the deaths from consumption under 60 years of age amounted to 18·6 per cent. of the total deaths; and in 1846, a year of mean mortality, they were no less than 21·7 per cent. of the total deaths. The causes of the excessive mortality of this disease in Paisley are well worthy of a careful investigation, for it cannot for a moment be doubted that much might be done to arrest its fatality. The peculiar habits of the people, but especially the nature of the occupation of a large proportion of the inhabitants,—a manufacturing population confined to the close air of cotton mills and other manufactories, aggravated no doubt by the children being forced to work at a too early age, drugged, perhaps, with laudanum during infancy, &c., may perhaps be the chief causes of this large mortality from consumption.

The proportional mortality of diseases of the brain was lowest in Greenock and highest in Dundee. In Greenock, the deaths from brain diseases amounted to only 2·3 per cent. of the total deaths; in Paisley, to 4·2 per cent.; in Glasgow, to 4·7 per cent.; in Leith, to 6·0 per cent.; in Edinburgh, to 6·1 per cent.; while in Dundee, they amounted to no less than 7·4 per cent. of the total deaths.

The peculiarities which each of these towns presented in their mortality during the past year, may therefore be summed up in a few words. GREENOCK, with a constant small mortality from diseases of the brain, has almost wholly escaped scarlet fever, measles, and hooping-cough; while it has suffered more than any other town from typhus fever. DUNDEE, with a constant low mortality from consumption, has suffered much from typhus fever, and has been ravaged to a greater extent by scarlet fever and small-pox than any other town. The mortality from brain diseases has also been excessive. PAISLEY, with a constant and excessively high mortality from consumption, has suffered considerably from scarlet fever, typhus fever, and small-pox. ABERDEEN, from the imperfect returns of diseases I have procured, seems to have suffered greatly from scarlet fever, apparently as much as Dundee itself. GLASGOW, with its rather high mortality from consumption, has suffered considerably from typhus fever, scarlet fever, and cholera, during the past year, to which list small-pox also might be added. EDINBURGH, with its comparatively low mortality from consumption, has suffered much from typhus fever, scarlet fever, and cholera. And LEITH, also with its low mortality from consumption, though it did not suffer so heavily from typhus fever, was ravaged by cholera and scarlet fever.

As the mortality in Edinburgh seems to be peculiarly under the influence of atmospheric agencies, it was intended to have concluded with a few remarks on the influence of weather on the different classes of disease. As the attention has, however, been so frequently devoted to the subject in the quarterly reports, it would only be waste of space to repeat here what is given there in detail. It may, however, be remarked, that in order to observe the influence of atmospheric agencies on any great mass of human beings, it is absolutely necessary that they be placed in a situation where the weather will affect nearly all alike. If, therefore, we endeavour to draw any conclusions as to this influence from the varying number of deaths over a whole county or kingdom, we should probably fail in deducing any useful information; for it might happen that weather which increased disease in one locality, would arrest it in another, in consequence of its different situation as to height, exposure, shelter, or drainage. Observations extending to a whole county or kingdom will therefore only exhibit in general the influence of season, but not that of the varying meteorological changes, which quite as much influence the mortality of diseases in each locality. Closely adjoining as are Edinburgh and Leith, even three years' observations clearly demonstate that they are differently and often quite oppositely affected by the same atmospheric changes. To how much greater an extent, therefore, must difference in site, exposure, &c., modify the influence of weather on mortality over a whole county or kingdom. In order to observe this atmospheric influence on disease, the observations must in each case be confined to one locality, and the observer would require to be on the spot to note all the varying changes which it is necessary to notice. This has been imperfectly attempted to be done for Edinburgh for the last three years, and the Quarterly and Annual Reports on the Mortality there, are referred to for the result of these observations.

The following is the abstract of the Edinburgh and Leith Mortality Tables for 1848, classified according to ages and diseases ; to which is appended a table exhibiting the monthly meteorological phenomena along side of the mortality.

Edinburgh and Leith Table of Ages for 1848.

AGES.	EDINBURGH.			LEITH.		
	Males.	Fem.	Total.	Males.	Fem.	Total.
1 year and under	408	299	707	78	70	148
1 to 2 years	185	206	391	51	56	107
2 — 5 -	289	277	566	76	70	146
5 — 10	185	193	378	43	47	90
10 — 15 -	64	66	130	14	13	27
15 — 20	122	96	218	20	18	38
20 — 30 -	318	285	603	47	43	90
30 — 40	305	299	604	64	73	137
40 — 50 -	283	262	545	57	66	123
50 — 60	230	253	483	47	52	99
60 — 70 -	160	202	362	32	52	84
70 — 80	118	164	282	24	47	71
80 — 90 -	41	51	92	5	18	23
90 — 100	2	11	13	0	1	1
100 and upwards	0	1	1	0	0	0
Not stated -	49	51	100	9	19	28
Total deaths,	2759	2716	5475	567	645	1212
Still-born, -	166	113	279	38	31	69
Total, -	2925	2829	5754	605	676	1281

Edinburgh and Leith Classified Table of Diseases for 1848.

Class.	Disease.	Edinburgh.			Leith.		
		M.	F.	Tot.	M.	F.	Tot.
I.	Zymot., or epidem., endem. & contag. dis.	1284	1184	2468	251	317	568
II.	Diseases of uncertain or variable seat,	206	211	417	33	36	69
III.	Diseases of brain and nervous system,	208	174	382	41	32	73
IV.	Diseases of respiratory organs,	409	412	821	88	74	162
V.	Diseases of heart and blood-vessels,	50	35	85	9	5	14
VI.	Dis. of stomach & other organs of digest.	282	280	562	60	57	117
VII.	Diseases of kidneys and urinary organs,	11	11	22	2	1	3
VIII.	Child-birth, and diseases of uterus, &c.	...	76	76	.	14	14
IX.	Diseases of bones, joints, &c.	14	9	23	4	1	5
X.	Diseases of integumentary system,	3	1	4	1	1	2
XI.	Old Age, ...	137	230	367	29	71	100
XII.	Intemperance, violent deaths, & suicides,	80	41	121	28	11	39
	Causes not specified, . .	75	52	127	21	25	46
	Total deaths, .	2759	2716	5475	567	645	1212
XIII.	Still-born, ...	166	113	279	38	31	69
	TOTAL, . .	2925	2829	5754	605	676	1281

Edinburgh and Leith Table of Diseases for 1848.

Class.	Disease.	Edinburgh.			Leith.		
		M.	F.	Tot.	M.	F.	Tot.
I.	Small-pox, - -	48	48	96	4	1	5
	Measles, -	24	31	55	3	6	9
	Scarlet fever, -	270	260	530	78	81	159
	Hooping-cough, -	38	56	94	7	15	22
	Croup, - -	26	25	51	8	10	18
	Thrush, -	4	...	4	...	...	...
	Diarrhœa, - -	32	43	75	3	8	11
	Dysentery, -	6	10	16	3	2	5
	Cholera, - -	196	282	478	75	110	185
	Influenza, -	16	27	43	...	8	8
	Ague, - -	2	...	2	...	...	...
	Remittent fever, -	10	5	15	3	3	6
	Typhus fever, -	594	371	965	64	63	127
	Erysipelas, - -	17	26	43	3	9	12
	Syphilis, -	1	...	1	...	1	1
II.	Inflammation, -	14	7	21	1	1	2
	Hæmorrhage, -	9	2	11	2	1	3
	Dropsy, - -	55	87	142	8	6	14
	Mortification, -	8	7	15	3	...	3
	Cancer, - -	1	17	18	1	8	9
	Atrophy, -	11	19	30	...	3	3
	Debility, - -	91	59	150	11	12	23
	Sudden death, -	10	7	17	5	4	9
	Other diseases of uncertain seat,	7	6	13	2	1	3
III	Cephalitis, -	15	11	26	2	1	3
	Carry forward,	1505	1406	2911	286	354	640

Class.	Disease.	Edinburgh.			Leith.		
		M.	F.	Tot.	M.	F.	Tot.
	Brought forward,	1505	1406	2911	286	354	640
	Hydrocephalus, -	59	54	113	19	12	31
	Apoplexy, -	44	18	62	2	8	10
	Paralysis, - -	43	50	93	8	8	16
	Convulsions, -	14	10	24	2	1	3
	Epilepsy, - -	5	8	13	...	1	1
	Insanity, -	15	12	27	4	1	5
	Other diseases of the brain,	13	11	24	4	...	4
IV.	Laryngitis, -	1	...	1	...	1	1
	Quinsey, - -	11	11	22	1	...	1
	Bronchitis, -	5	11	16	5	1	6
	Pleurisy, - -	5	5	10	2	2	4
	Pneumonia, -	69	57	126	13	11	24
	Hydrothorax, -	16	13	29	...	1	1
	Asthma, -	38	28	66	6	4	10
	Consumption, -	250	283	533	60	53	113
	Lung disease, -	14	4	18	1	1	2
V.	Pericarditis, -	2	...	2	...	...	...
	Aneurism, -	1	...	1	2	...	2
	Heart disease, -	47	35	82	7	5	12
VI.	Teething, -	62	50	112	8	13	21
	Enteritis, gastritis, and peritonitis,	118	128	246	33	23	56
	Tabes mesenterica, -	65	64	129	14	15	29
	Stomach disease, -	7	5	12	...	...	...
	Liver disease, -	14	15	29	...	3	3
	Other dis. of organs of digestion,	16	18	34	5	3	8
VII.	Nephritis, - -	1	2	3	...	...	...
	Diabetes, -	1	1	2	...	...	...
	Stone, - -	5	1	6	1	1	2
	Kidney disease, -	4	7	11	1	...	1
VIII	Child-birth, -	...	63	63	...	10	10
	Paramenia, -	...	3	3	...	1	1
	Ovarian dropsy, -	...	2	2	...	2	2
	Disease of uterus, -	...	8	8	...	1	1
IX.	Rheumatism, -	1	4	5	1	...	1
	Spine, joint, and bone disease,	13	5	18	3	1	4
X.	Fistula, ulcer, and carbuncle, -	3	1	4	1	1	2
XI.	Old Age, -	137	230	367	29	71	100
XII.	Intemperance, -	1	1	2	1	...	1
	Violent deaths and suicides,	79	40	119	27	11	38
	Causes not specified, -	75	52	127	21	25	46
	Total deaths,	2759	2716	5475	567	645	1212

EDINBURGH METEOROLOGICAL AND MORTALITY TABLE FOR 1848.

Mouth.	Barometer.				Thermometer.				Rain in inches.	Winds.	Mortality in Edinburgh.—1848.					
	Highest.	Lowest.	Mean.	Range.	Highest.	Lowest.	Mean.	Range.			5 years & under.	Between 15 & 60.	Above 60.	Total deaths.	Still-born.	Total.
January,	30·26	28·80	29·60	1·46	54°	5°	33·48	49°	1·26	W, E.	175	315 + 12	114	616	31	647
February,	30·10	28·10	29·06	2·00	57	15	39·60	42	5·21	W, E.	181	272 + 7	82	542	32	574
March,	29·90	28·20	29·24	1·70	61	26	41·19	35	2·80	W, E.	142	240 + 3	85	470	19	489
April,	29·88	29·04	29·45	0·84	65	26	43·31	39	1·06	E, NE, NW.	124	204	63	391	19	410
May,	30·12	28·96	29·75	1·16	78	35	54·58	43	0·60	W, E.	134	172 + 6	53	365	34	399
June,	30·00	29·00	29·46	1·00	75	37	55·13	38	6·04	E, W	137	170 + 5	39	351	19	370
July,	30·18	28·74	29·57	1·44	82	38	57·88	44	1·36	W, SW.	113	128 + 5	44	290	23	313
August,	29·93	29·06	29·50	0·87	70	36	54·37	34	2·00	W, E.	153	110 + 6	41	310	24	334
September,	30·12	29·08	29·59	1·04	76	35	53·94	41	1·45	S & SW, E.	197	108 + 2	43	350	22	372
October,	30·13	28·88	29·36	1·25	64	28	46·72	36	4·56	S, E.	283	173 + 4	56	516	9	525
November,	30·39	28·82	29·51	1·57	53	25	40·31	28	2·42	SW, S.	282	293 + 35	78	688	23	711
December,	30·08	28·27	29·66	1·81	59	21	40·24	38	1·45	S, E.	251	268 + 15	52	586	24	610
Year,	30·39	28·10	29·48	2·29	82	5	46·73	77	30·21		2172	2453 + 100	750	5475	279	5754
Mean of months.	30·09	28·74	29·48	1·34	66	27	46·73	39	2·51		181	204 + 8	62	455	23	478

Canaan Cottage, where the meteorological tables are kept by Alexander Adie, Esq., is situated about a mile to the south of Edinburgh, in latitude 55° 57′, and is 246 feet above the mean level of the sea.

The figures after the + mark in the second column of the mortality table show the number of persons whose ages were not ascertained.

ART. VIII.—*Notice of the Copalchi-bark; a new and valuable Bitter analogous to the Cascarilla.* By JAMES STARK, M.D., Fellow of the Royal College of Physicians of Edinburgh.

IN the course of some inquiries into the remedies used in Chili and Peru, I received from one of my correspondents in Chili, a bitter bark under the name of *Natri*, which was stated to be much employed by the medical practitioners and natives of Chili in the treatment of intermittent and other fevers, and held in higher repute than even Peruvian bark itself. The bark and leaves sent enabled me to ascertain that the Natri was the produce of a species of Croton, but, from the want of the flowers and fruit, the particular species could not be ascertained.

In the course of a correspondence with my friend John Eliot Howard, Esq., Tottenham, he mentioned to me that a quantity of bark had been received by the Messrs Gibbs of London, from San Blas, which appeared to be analogous to, if not identical with the *Natri.* A small quantity of the same bark had also been brought over from Santa Cruz by a gentleman, who stated that it was there known under the name of Chiquique, and was *always* given to the Indians in fever cases, and was considered by the medical practitioners there as superior in certain cases to cinchona bark itself.

Mr Howard at once recognized this bark as the Copalchi Bark of Goebel, a valuable Mexican bitter, described by him as the product of the Croton suberosum; and through the liberality of the Messrs Gibbs, that gentleman sent me first a few pounds to make trial of it in practice, and then the whole quantity imported into this country.

Though it has not been in my power to lay my hands on Goebel's description, I have satisfied myself as to this bark being that known in Europe since 1825, and described under the names of Copalchi Bark and Quina blanca,—the product of one tree, variously termed Croton suberosum by Humboldt and Bonpland, Kunth, &c., Croton pseudo-china by Schlechtendal and Nees Von Esenbeck, and Croton Cascarilla by Professor Don.

The description of the bark given in the Dictionnaire Universelle de Matiere Medicale, accurately corresponds with the specimens in my possession, as does also that given in the Dict. des Drogues Simples et Composées. In these articles it is described as a new and valuable bitter used in Mexico, similar in properties to Cascarilla, and believed to be the produce of the Croton suberosum of Humboldt.

It is to Schiede and to Nees Von Esenbeck, however, that we are chiefly indebted for ascertaining the exact species of plant which yields the Copalchi bark, and showing by their descriptions and figures, that the tree which they describe as yielding it is that formerly called by Humboldt the Croton suberosum. Schiede, as well as Nees Von Esenbeck, found this Copalchi—(which is the Indian name)—sold in the apothecaries' and druggists' shops at Jalapa, and over the province of Mexico, under the name of *Quina blanca*, and considered by them there as the finest and best sort of Cascarilla. Indeed, Schiede was so convinced that he had discovered the true source of the best cascarilla, that from the examination of the tree which produces this quina blanca, he asserted that the best cascarilla was the produce of the Croton pseudo-china of Schlechtendal—now called by Professor Don, the Croton cascarilla.

Nees Von Esenbeck only went the length of considering the Copalchi as closely resembling the cascarilla, and gave, in the supplement to his splendid work the "Plantæ Medicinales," most beautiful coloured figures of the copalké-croton in all its states, flowers, fruit, leaves, and bark, rendering it perfectly impossible ever hereafter to mistake the bark or plant which he describes. He also terms the tree the Croton pseudo-china.

Copalchi bark was subjected to a minute analysis by Mercadieu in 1825, who found it to contain no crystallizable alkaloid, but the following principles: 1. An astringent matter, of a deep brown colour. 2. An excessively bitter principle (containing also an astringent principle), soluble in water. It is in this bitter principle that the febrifuge properties reside which the physicians at Vera Cruz have recognized it to possess. 3. A green fatty substance. 4. A clear brown resin, insipid and inodorous. 5. A brown animalized colouring matter, insoluble in ether and absolute alcohol, but soluble in dilute alcohol and in water. 6. Starch. 7. Woody fibre. 8. Phosphate and oxalate of lime. The burnt ashes yielded hydrochlorate and sulphate of potass, oxides of iron and of manganese, carbonate and phosphate of lime, with traces of magnesia and silica.

Brandes, who analyzed this bark the year following, could not detect any crystallizable alkaloid, but recognized the bitter principle on which its active properties depended—a resin, concrete fatty oil, &c.

This bark is now undergoing a minute analysis by Dr Douglas Maclagan and Dr Anderson. Meanwhile, my friend, Mr Howard, has made some trials to prepare the bitter principle in a pure state. The bark was exhausted by almost absolute alcohol; this tincture evaporated to dryness; the bitter principle removed from this extract by cold water, which left a residuum of waxy matter, and, on evaporating this aqueous solution to dryness, the bitter principle was obtained in dark brown, almost black, lustrous, but non-crystalline scales, of an intensely bitter taste. The bitter principle thus procured possesses the strange property of being deliquescent, requiring it to be kept in closely stoppered phials.

Copalchi bark yields an agreeable aromatic bitter to water, but especially to proof spirit. The tincture and spirituous extract, indeed, are agreeably aromatic, and on first tasting, leave on the tongue and palate a sweetish taste.

Since I received the first samples of Copalchi bark, I have made trial of it in a few cases, which seemed tolerably well fitted for testing its properties,—if it possessed any.

The first case was one of atony of the stomach and bowels, with weak and imperfect digestion, and irregular action of the bowels, at one time costiveness, at another, slight diarrhœa existing. In this case, the usual bitters, as gentian, quassia, and colombo disagreed, exciting nausea, &c., while Peruvian bark and quinine increased the headach, and induced a feverish state of the system. The case, however, wonderfully improved under the use of the simple infusion of the Copalchi, of the strength of half an ounce of bark to the pint of boiling water, given in table-spoonful doses three times daily.

In the second case in which trial was made of Copalchi bark, the patient suffered from irregularity of the bowels, but with this peculiarity (several instances of which came under my notice during the past winter during the prevalence of cholera), that twice daily, viz., at three o'clock afternoon and three o'clock morning, more or less violent spasmodic cramp in the bowels came on, preceded by shiverings and coldness, and terminating by a sweating stage. Quinine in 1½ grain doses twice daily, had been given for two days, with the effect of completely checking these intermittent paroxysms, when it was obliged to be stopped, in consequence of its inducing violent headaches, flushing of face, and feverishness. The paroxysms immediately returned as before, but, on substituting infusion of Copalchi, giving a wine-glassful at two o'clock afternoon, and the same quantity at bed-time, the paroxysms were arrested, and have not since returned.

Like relief followed in another but milder case of the same nature. In this case, the cure was trusted entirely to the Copalchi, no other medicine being given, in order to see whether it really possessed any antiperiodic powers. It is therefore scarcely possible to doubt that it possesses some antiperiodic virtue, so that we can easily believe what is stated of its powers by the Mexican and Peruvian physicians in arresting the paroxysms of intermittent fevers.

It has been used in several other cases, but without the results being so striking as to render its superiority to other bitters unquestioned. I am at present giving it in a case of epilepsy, in which all other bitters had disagreed, excepting that much neglected but valuable bitter, the trefoil (*Menyanthes trifoliata*), and the case, so far as it has gone, has proceeded satisfactorily under the use of the Copalchi bark. Dr Bennett informs me that he is administering it to an epileptic case in the Royal Infirmary, apparently with marked benefit.

When I received the first few pounds of Copalchi bark, I sent some to the Royal Infirmary, and to the two principal Dispensaries, in order to let this bitter get a fair trial. I have not yet received reports from these institutions, but learn that in every case in which this bitter has been administered, it has given satisfaction, proving an agreeable light bitter. Being now in possession of the whole importation of this bark, through the liberality of the Messrs Gibbs, and being anxious that its powers should be fairly and thoroughly tested by the medical men of Edinburgh, parcels of it have been sent to the Royal Infirmary, to the New Town and Royal Dispensaries, and to the Leith Dispensary; and the remainder lies with the Messrs Duncan & Co., druggists, at whose shops in Edinburgh and Leith, small quantities of the bark may be obtained gratuitously, by those who wish to prepare it for themselves. The Messrs Duncan & Co. will also keep the infusion, decoction, tincture, and spirituous extract ready for prescription, charging merely for the trouble and cost of materials used in the preparation, as the bark itself is *not to be sold* at present. Should the bark be found to prove a valuable addition to our stock of bitters, it could soon be procured from Mexico and Peru, in any desired quantity; meanwhile, I would invite the profession in Edinburgh to make trial of it, and shall feel much obliged if they will make the results of their trials known to me.

It appears to me, that one of the great wants in the medical practice of the present day is, a good light bitter of some real therapeutic powers. Most of the bitters in common use are harsh, disagreeable, and heavy, often exciting nausea, aggravating rather than allaying the irritability of a stomach already too irritable. To avoid these it has become of late too much the practice to employ quinine, bebeerine, strychnine, or other concentrated bitters or alkaloids, which in many cases do more harm than good. Satisfied I am of this, that in dyspeptic cases especially, by employing the alkaloids or bitter principle, separated from the aromatic, resinous, or other principles with which they are usually associated, we destroy to a great extent the therapeutic powers of the drug, and fail to derive those benefits which we should receive from making use of a spirituous extract, a tincture, or even the simple infusion or decoction of the drug. The warm aromatic principles, associated with the powerful bitter in the Copalchi, seems to me to supply the want of a light bitter, which most practitioners must have experienced; and it is to be hoped, that it will succeed in the hands of others as much as it has as yet done in mine.

It may be remarked, that the infusion and decoction of Copalchi are best made of the strength of half an ounce of bark to one pint of water. The tincture, with one ounce of bark to one pint of proof spirit. The dose of the infusion and decoction is a tablespoonful or small wineglassful twice or thrice daily. Of the tincture, one or two tea spoonfuls, or of the extract from one to two grains, twice or thrice daily.

As Copalchi bark yields freely much colouring matter, might it not be employed with advantage in dyeing? One, at least, of the crotons yields a valuable dye; and even the cascarilla itself is used in France as a dye-stuff, yielding a rich black colour, which is easily fixed on stuffs little fitted for receiving fine dyes.

ART IX.—*Some Account of* JAMES YONGE, Esq. *of Postlynch, Devon; Surgeon, Plymouth, and Licentiate of the Royal College of Physicians, London; the Original Proposer of the use of Oil of Turpentine as a Styptic. From authentic documents communicated by his representatives.*

JAMES YONGE was born at Plymouth, in the county of Devon, on the eleventh of March, sixteen hundred and forty-six, and was baptized on the 27th February 1647, in St Andrew's Church of that town, by Mr George Hughes, vicar of the same. His father was John Yonge of Plymouth, but who had previously come from Sturminster-Newton in Dorsetshire, and originally had been settled at Lansend, in the parish of Colbrooke. His mother was Joanna Blackaller. His father appears to have been a practitioner of surgery.

When nine years of age he had learned to read and write; and he was then placed at the grammar school under Mr A. Horsemann, where, in the course of two years, he passed through the usual forms, and began to read the Metamorphoses of Ovid.

Any scholastic instruction which James Yonge received must have been slender. It is manifest, nevertheless, from his writings, that his education was good. He must, therefore, have had good natural talents, and cultivated them with some industry.

At this school he had been little more than two years, when his father, having disposed of his elder brother, John Yonge, bound James in 1657 for eight years to Mr Silvester Richmond' who was at that time surgeon of the Constant Warwick, carrying 31 guns and 150 men, commanded by Captain Robert Voysey. This situation appears to have furnished him with the first means which he enjoyed of studying the principles and practice of surgery. He enjoyed neither the advantage of residence at either of the universities, or of hearing such lectures, or receiving such instructions, as were at that time delivered in London. To those who know the course of medical and surgical education since that time, it must appear singular to learn, that the only professional education which a surgeon obtained, was on board of a sloop of war, under the eye of the surgeon, and as his assistant. Such, however, was the fact; and it appears further, from the accounts left by Mr Yonge himself, that he was not the only apprentice whom the surgeon, Mr Richmond, was allowed to receive on shipboard. It appears that a Mr Jinkinson was also trained in the same school, at apparently the same time as James Yonge. Of Silvester Richmond, who subsequently settled as a surgeon in Liverpool, Mr Yonge long after speaks in terms of great respect and gratitude. Subsequent accounts show that the situation itself was far from being desirable.

At this time the British dominions were governed by Oliver Cromwell, who, after having effected a pacification of the domestic discords rather superficial and temporary, was anxious to support his power and influence by foreign conquests and naval expeditions. In the spring of 1655, Penn and Venables were sent to the West Indies with a force of 4000 men, in order to attack the Spanish settlements in Hispaniola and Jamaica. In the attack on the former the English were unsuccessful, being finally repelled from the island by the Spaniards. In the expedition to the latter they succeeded. The result of this violation of treaty was an immediate declaration of war in 1656 by the Spaniards against England; and the ships of that nation accordingly infested the coasts of England and the seas frequented by British ships, and caused much damage by the captures which they made.

On the 14th February 1657 the Constant Warwick was ordered on a cruise, in company with the Adventure frigate, to repel the attacks of the Spanish vessels; and in her sailed James Yonge at the age of 11 years, to act as surgeon's apprentice. The cruising ground appears to have been the chops of the channel, the south coast of Ireland, and the west coast of France. He seems on this cruise to have seen service; for the Adventure and her consort met with the Michael, a Spanish corvette, a Biscayan of St Sebastian, 28 guns and 180 men. The Spaniard, by a vigorous broadside, first disabled the Adventure, and then came down on the Constant Warwick, thinking she was a merchant-vessel under convoy. The Constant Warwick fought the Spaniard for five hours, shot away his masts, and killed many of his men; while the Englishman had only two men wounded. The Spaniard was captured, and she was afterwards used as an English vessel under the name of the Coventry.

In 1658 the Constant Warwick put into Kinsale for a short time. Near the Scilly Islands they took another vessel, a snow, of 4 guns. At this time, on the 3d September 1658, he states in his diary, died Oliver Cromwell; and soon after, near Scilly, they encountered so violent a storm, that James Yonge was nearly washed overboard. They again sailed from Plymouth, and touched at Morlaix, on the coast of France, Torbay, on the Devonshire coast, St Maloes, Guernsey, and Jersey, and again returned to Plymouth.

In 1659 they received orders to cruise off the coast of Bretagne, and visited several of the islands there, as Ushant Belleisle. In the summer of this year, the Constant Warwick cruised over the same seas, visiting Falmouth, Kinsale, Cork, and in the month of June the Downs, Dover, Woolwich, and London. At this time the cruise was directed to the North Sea, and they touched at Hamburgh and Heligoland. Upon returning to Plymouth they were ordered to act as convoy to a fleet to Rochelle; and in this short run he states that one ship struck on the Eddystone, on which at that time there was no lighthouse.

Soon after, and in the course of the same year, he had occasion to witness an incident, which shows the lawless and violent character of the nautical adventurers in those days. Being for ten days off the Land's End, they saw a large ship with a small one close beside her. As the Constant Warwick approached them, the small vessel stood inward, while the large ship waited till the Constant came up. The captain of the large vessel now informed the English commander that he was from Hamburgh, and that the small vessel had boarded and was plundering his ship. Captain Voysey gave chase to the pirate, who was desirous to get his vessel among the shallows, by running close in shore in Whitsand Bay. The Constant Warwick fired, and in the presence of great multitudes who had come out to see the affair, captured the piccaroon, as Mr Yonge terms the vessel of the pirate.

In 1660–61, being left in Portsmouth while the Princess Henrietta went to France to marry the Duke of Anjou, Mr Yonge spent the time in reading, in the study of botany, and the vegetable materia medica. This space extended from the 10th or 11th of January to the beginning of April.

In May the same year, when he could not be more than 14 years of age, he states that he was appointed as chirurgeon's assistant to the Montague, of 64 guns, and 250 men, which formed one of the fleet lying at the Downs, under Lord Sandwich, consisting of 13 ships, one eighty-four, one seventy-two, three sixty-fours, three fifty-twos, three forty-six gun-ships, one of 34, and one of 28 guns.

Much speculation and inquiry were at this time excited on the destination of this large naval force; some imagining it was to proceed against Algiers and the Moors; others, that it was to make an attack on the Dutch possessions in the East Indies. Meanwhile, either the whole fleet, or part of it, and, among others, the Montague, sailed for Algiers, where they arrived in the course of a few weeks. There, after a preliminary reconnoitring in boats, they commenced an attack, which was well-resisted by the Algerines. The fighting and bombardment lasted six hours, in the course of which the Montague had one officer, the boatswain, and one man killed, and four men wounded. One of the wounded men died.

Though this was not the first introduction of James Yonge to the casualties and accidents of combats by sea, it made him feel most acutely all the hardships to which the surgeon's assistants were in those days subjected, especially after a battle. He went down, he tells us, to dress the wounded men, who were placed on heaps of clothes to make it soft for them. Here he had not only to dress wounds, but to perform all those menial duties which are at present done by nurses and surgery attendants. To boil gruel, to make barley-water for the sufferers, to prepare fomentations and poultices, to wash and dry bandages and rollers, to administer glysters, to make even the hammocks, to shave and trim any one requiring it—such were the duties, besides the ordinary business of spreading ointments and plasters, which it fell to the lot of James Yonge to perform, when surgeon's assistant in the Montague. For three days after the fight they lay before Algiers, and there the Montague and some other ships were ordered to sail for Lisbon. During the whole of this time, his slavery, as he calls it, was uninterrupted. He had to perform all the drudgery, and was so miserable that he often wished for death. Meanwhile, he complains that he received neither one line nor any money from his father. His wish for death appears to have been very nearly realized, in the course of the voyage to Lisbon, for he was nearly wrecked off Cape Porgas.

At Lisbon the fleet lay till the 13th of April 1662, when, after receiving Catharine of Braganza, they set sail on the following morning for England; and after a lapse of three weeks, arrived at Mount's Bay. It is unnecessary to speak of the marriage of this princess to Charles the Second, which speedily followed, and which is matter of civil history. After this event, James Yonge was discharged for a time, from the service of the navy.

He now, about the end of May, went to London, with the intention of improving himself in the knowledge and practice of surgery, and spent four months with Mr Clark, a surgeon-apothecary of Wapping, learning the art of compounding medicines, and practising surgery among the population of that nautical district; and he acknowledges that he learned a great deal.

It is not without interest here to remark, as characteristic of the manners of the times, how general the taste for witnessing executions appears to have been, even among persons of education. On the 14th of June 1662, at 11 A.M., Sir Henry Vane underwent on Tower Hill that final punishment which, along with the executions previously made on the regicides, throws so black a stain on the reign of the second Charles; and Mr Yonge informs us he was present, and saw Sir Henry Vane die with the fortitude of a Roman. This last scene of these bloody times,—for it was the last till sixteen years afterwards, when the axe was once more whetted for Coleman, Grove, Pickering, and other victims of the Popish plot,—was beheld by thousands more, and, among others, by Samuel Pepys, Secretary to the Admiralty, and various of his friends.

In September, Mr Yonge returned to Plymouth, and bound himself to his father for seven years. This second indenture, however, continued not long. He complains that he had nothing to do but to write letters; that his father treated him with great cruelty; that he was extremely unhappy, and again longed for death. In February 1663, accordingly, he was engaged by his father to go as surgeon of the Reformation, a vessel of 100 tons, carrying 3 guns and 70 men, to Newfoundland. On 28th September he returned to Plymouth; in March 1664 he sailed in the Bonaventure, carrying 16 guns and 28 men, for the West African Coast, where he saw the Peak of Teneriffe; then went up the Mediterranean, visited Carthagena, Alicant, and Genoa, at which last place he appears to have spent some time. At Capri he saw Vesuvius; and after visiting various places, as the Island of Lipari, Sardinia, Galita, and Algiers, he returned to England, and arriving at Plymouth, again received a temporary discharge from the service.

On the 21st of December 1665, he again sailed in the same ship, in convoy with 18 ships of war under Sir Jeremiah Smith, and 22 merchant vessels for Tangier, where he arrived on the 22d January; and thence sailed for Madeira, Teneriffe, Bonavista, and others of the Cape de Verd Islands. There, off St Mayo, when they were in company with a Scottish vessel, they descried two ships with Spanish colours, which, upon approaching them, hoisted the Dutch flag and bore down on the English. They were very large ships, and by five P.M., they threw several shots over the English. The Scottish vessel escaped; but the Bonaventure struck, a catastrophe which Mr Yonge attributes to the circumstance of the captain being a Quaker and a great coward, and to the men being likewise poltroons, he having found ten of them concealed, while the Dutch shot were pouring into the vessel. This event was followed by great severities and cruelties on the part of the captors.

The whole crew were carried on board the Dutchman, and shackled in bilboas two by two. Mr Yonge was shackled with Jacob Perry, and remained in this state night and day for seven weeks. The ships were Guinea traders, one carrying 24 guns and 90 men; the other, 20 guns and 50 men. They sailed immediately northward, and round the north of Scotland, to avoid meeting with English vessels; and after touching at Orkney on the 5th of July, they arrived at Amsterdam on the 20th.

Their fetters had now been on 51 days, when they were removed. But Mr Yonge was so disabled, that he felt light on the right side, and walked, he says, like a chicken, all on one side. They were imprisoned in the West India Pack-house, a place greatly too small, in a loft or upper apartment, where were already one hundred and fifty men. The heat was intense and stifling; and the smell most offensive. These men were sailors of the English fleet, who had been taken prisoners in the great fight off the Galloper, on the 1st of June. Their beds in this place of suffocating heat consisted of coarse canvas bags, filled with husks of hemp-seed, without any coverings. Mr Yonge had a little money, and with this he purchased tobacco, which served to render him less sensible to the pernicious smell.

From Amsterdam, after the lapse of three weeks, they were removed, chained in a line, and conveyed to Rotterdam. There they were taken, 16 in number, to the Prinzen Hoeff or Admiralty House, and placed in a dark room like the Clink at Plymouth, 22 feet long, and 14 feet broad, with windows trebly grated, and enclosed by a wall so high that they could not behold the sky. Neither bedding nor straw was allowed them. Their daily allowance of food was one pound of coarse rye bread, two ounces of butter, and one quarter of a pound of cheese. Mr Yonge was deprived of his books and writing materials; and all his money was exhausted.

Fatigue, confinement, want of air, and bad food, in this chamber of little ease, were followed by their usual effects; and in August, Mr Yonge was attacked with fever, the ordinary remittent of the country and season, in consequence of which he was carried to an hospital, where he lay three weeks. He then began to recover, and with the small amount of strength, he attempted to escape. In this he was unsuccessful. He was taken back to prison, where the poisonous air was doing its business among his comrades, most of whom were labouring under the autumnal remittent fever, and where two of the prisoners died; while the carpenter, by the aid of Mr Yonge, was enabled to escape from this dungeon.

At length, on the 20th September, he got out on parole for some Hollander, and attempted to resume his studies, when, in the beginning of 1667, fortune began to show him some favour. There was in prison at Harwich, in England, a Hollander named Derrick Gerritza Cock, a relative of the Secretary to the Admiralty. This person had made application to his relative to be exchanged against any English prisoner; and a passport was given to Mr Yonge to return to England, in order to restore Derrick Gerritza Cock to freedom and to Holland; and he accordingly came to Sandwich, and proceeded thence by London to Plymouth. Here he spent the time from April 1667 till the following year, partly in practice, by which he made a little money, he says, to maintain himself, and partly in study.

On the 23d February 1668, he sailed once more to Newfoundland, and appears to have performed, in the course of two years, two voyages to that country, and finally returned to Plymouth on the 29th September 1670. He now took leave of the sea after fourteen year's naval service, with the resolution of settling in his native town, and attempting by the exercise of his profession to maintain himself at home. Here Mr Yonge pauses to thank God for his goodness to him when at sea; "for which," he says, "I have to praise Him. I beseech Him to give me as good success in my designs ashore. I hope it will be more quiet and less dangerous. For surely the dangers of the sea are equal to those of the poet in his tragedy:"—

> "Qui vultus Acherontis atri,
> Qui Styga tristem non tristis vides
> Audesque vitæ ponere finem,
> Par ille regi, par superis eris." '

At Plymouth accordingly, he fixed himself in the 25th year of his age, and got, for a beginner, a considerable amount of business. An accident did him good service. A men fell from the topmast of a ship of 200 tons burden, and fractured his skull, he says, from the crown to the ear. Yet, under the care of Mr Yonge, he recovered. Some other surgeons tried, he says, to suppress him; but he had the advantage. He was patronized by Lord Mount Edgecumbe, and Henry Ford, Esq., Commissioner for the Western district, a man of great learning.

On the 28th March, having a reasonable prospect of success, he entered into the matrimonial state with Jane Crampphorne, a young lady of most respectable family and connections; and the beginning of the subsequent year saw him the father of a son. Good fortune seemed to follow him. Mrs Crampphorne, the mother of Mrs Yonge, had a near kinswoman married to Sir Thomas Clifford of Chudleigh, High Treasurer of England, and subsequently Lord Clifford.

War had recently broken out with the Hollanders and French; and a naval hospital was established at Plymouth, and Sir Thomas Clifford applied to the king to appoint, as surgeon to the hospital, James Yonge, as one who had witnessed much service at sea. The king gave his consent, and the warrant was forthwith sent to Plymouth. This office was a steady source of professional income. Mr Yonge had five shillings daily as constant pay; threepence was allowed for medicines for each patient, and the sum of two shillings and sixpence daily was allowed as pay for each hospital mate. In the winter of 1672–1673, the hospital was quite full, and contained sometimes 100 patients at one time. Spotted fevers were very prevalent; and with this disease he was attacked three times, caught from the patients, and, in one of these attacks, he narrowly escaped with life.

At this time, James Pearse, an intimate friend of Samuel Pepys, and often mentioned in the diary of the secretary, was surgeon to the Duke of York, afterwards James the Second, and surgeon-general to the navy. In 1674, Mr Pearse appointed Mr Yonge his deputy at Plymouth, an office which brought him an accession of emolument, giving him 6s. 8d. per man, and 1s. for victuals. This he acknowledges yielded him no small profit. He at the same time cultivated, with zeal and assiduity, the practice of his profession. In 1667, he inspected the body of Mr Antony Williamson, who had for three years a bullet in his windpipe, and sent an account of the case to Mr Robert Hooke, then secretary of the Royal Society, who, after communicating the relation to that learned body, published an abstract of it in the Lectures and Collections. At subsequent periods he communicated to the same body various memoirs recording facts of great pathological importance, and among others an instance of large intestinal concretion, removed by extraction, with favourable result,—and notices of two gall-stones of unusual size, which, after causing in one instance jaundice, and in both sickness and great pain, were discharged by the natural passages.*

Next follows an important epoch in the life of Mr Yonge, and on which he dwells with natural satisfaction. In 1678, he was in London with Mr Sparke, then member of parliament for the town of Plymouth. "Being one day invited by Mr Pearse to a cyder-house with Dr Short, Mr (Tyson†), Mr Hobbs, and another surgeon, (designed by Mr Pearse to try me); we talked warmly of many things. At last, talking of the restrictive liquor of Mr

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* Philosophical Experiments and Observations of the late eminent Dr R. Hooke, F. R. S., &c., and other eminent virtuosos of his time. Published by W. Derham, F. R. S. London, 1726, p. 79.

† In the MS. not very distinct.

Denys, now called the Royal Styptic, we discoursed of other things to stop hemorrhage. I quietly allowed each to give his opinion; when I demanded if they knew a thing that could incomparably stop hemorrhage of a wound, and that without manifest stypticity, sharpness, &c., but was one of the highest balsams, and should restrain the bleeding and digest together; secondly, if they could cure amputated stumps by consolidation. They confessed their ignorance, and laughed at the second as impossible; but I so explained and discovered myself, that they were extremely satisfyed, and Mr Pearse gave me great thanks, and asked me to write more on it. So I wrote my 'Currus Triumphalis e Terebintho,' which passed the approbation of the whole of Gresham College."

To this meeting Mr Yonge afterwards refers in the preface to the *Currus Triumphalis e Terebintho.* It may be proper to mention, that, by Gresham College in those days, is meant the Royal Society, which had been recently established, and held its meetings at Gresham College.

Now were to be made apparent the fruits of the labours and trials which Mr Yonge had undergone, in the course of fourteen years' service at sea and several years afterwards on shore. To any one who peruses this small treatise, it is evident that, short as it is, it could have been written by no person but one who had repeatedly witnessed the casualties and sanguinary scenes of naval warfare; and who, amidst the scanty and imperfect accommodation then allowed to wounded seamen, had been forcibly compelled to think of the most probable means of alleviating their severities, mitigating their cruelties, and counteracting their effects. Gunshot wounds, and injuries of the most dangerous character, hemorrhage from large vessels, comminuted fractures by chainshot, then recently introduced, and serious mutilations threatening immediate death, had given his mind that particular turn, which caused him to think of the most effectual surgical remedies, that experience could provide. The internal evidence of this small volume is sufficient, without other means, to show, that the author must have been a naval surgeon. In one passage, he shows that he was familiar with the use of a contrivance, similar to the tourniquet and its pad, for stopping hemorrhage from wounds of the limbs, and during amputation. In a short letter appended to the treatise, he distinctly described the method of amputation by the flap. Of his main subject—the uses of oil of turpentine as a means of suppressing hemorrhage, details are given in the Medical Intelligence.

Mr Yonge now became a person of great importance in his native town. He was elected successively a member of the common council for the borough of Plymouth (1679), churchwarden to St Andrew's Church (1682), and eventually (1694) alderman and lord mayor of Plymouth. In 1685, when the county militia were embodied, he was appointed surgeon to Lord Bath's regiment, an office which brought another accession of professional revenue. This, however, as little compatible with his avocations in the town of Plymouth, he gave up in 1689. A more suitable office was awaiting him. In 1692, he received from Admiral Russell and the other lords of the Admiralty, the situation of surgeon to the New Dock in Hamoaze, and, in consequence of this appointment, visited London.

There, he informs us, he went to Surgeons' Hall three days, to witness dissections and hear what were denominated readings or lectures delivered by Dr Tyson. He dined at the public dinner given by the college, and was made free, and, without an examination, a fellow or member, an honour which, he says, they never granted to any one previously. From various persons distinguished for professional or scientific knowledge, he received the most unequivocal marks of attention,—from Dr Browne, Dr Grew, Dr Hooke, Dr Lower, Dr Tyson, Mr Hobbes the surgeon, and Mr C. Bernard. Mr Yonge was also intimate with Sir Hans Sloane, and frequently corresponded with that zealous naturalist.

In 1697, by some accident, a Mr Parker of Bovington wounded his man-servant most seriously in the chest. Mr Yonge was called, and, under his care, the man got well, he states, in twelve days.

There is in the dates some little discrepancy regarding the order in which the two next events of the life of Mr Yonge occurred. The most probable order is adopted.

It was in May 1702 that he appears to have been in London, when he received the honour of the license of the Royal College of Physicians. At this time, he had been visiting Lord Clarendon, son of the chancellor, Sir George Rooke, Dr Atterbury, and other persons of distinction. Dr Charleton, with whom he was intimate, took him to visit Sir Thomas Millington, president of the College of Physicians, and then residing in Lincoln's-Inn-Fields. By Sir Thomas, who had been desirous to see Mr Yonge, he was received with great kindness and attention; and, after much conversation on various scientific subjects, when about to take leave, Dr Charlton proposed to make Mr Yonge a licentiate of the College, in which the president readily concurred. The proposal, as at first made, Mr Yonge did not feel much desire to accept, as he held the license of the bishop of the diocese, as it would be costly, and as he was too old to undergo examination. The president and his friend appear to have been rather scandalized at Mr Yonge's speaking in the same breath of the license of the College and that of the bishop, assured him that it was an honour obtained by few; that, as to examination, they were confident he could answer any plain questions they would propose; and that as to the expense the fees should be as moderate as possible. Indeed, both expressed their willingness to dispense, in the case of Mr

Yonge, both with fees and examination, were it not that on these points the statutes were imperative. The result was, that Mr Yonge agreed to accept the license, and the 23d May was appointed as the day of trial, at the house of the president. The examiners were the president, Dr Walter Charleton, Dr Samuel Collins, Dr Richard Portesse, and the registrar, Dr Thomas Gill. The examination, of which he has left a particular account, was on digestion, chylification, nutrition, the circulation, and their organs, and on pleurisy, empyema, and the operation of *parakentesis.* Dr Collins alone appears to have behaved with some degree of harshness. He asked the cause of the motion of the heart, and, not being satisfied with the answer of Mr Yonge, Dr Gill interfered. Mr Yonge observed, that he came hither to pass examination for a license to practise physic; and he thought that the subject would have been wholly practical; "but you are all upon theories and anatomical difficulties, as if I stood here for a doctor's degree, or to be chosen fellow, censor, or president of the college." This had the effect of rendering Dr Collins perfectly complaisant. The examination lasted from four o'clock to half-past five; the license was forthwith granted; and all of them complimented Mr Yonge upon the appearance which he made, and treated him quite as an equal.

Dr Samuel Collins, whom Mr Yonge mentions as aged and not very polished, is the author of a large and very excellent work on Anatomy, Human, Comparative, and Pathological. His work contains the most instructive information on comparative anatomy and morbid anatomy then extant, and may be perused with advantage at the present time. He is stated to have been well pleased with the discourse of Mr Yonge after the examination, and, on parting, wishing him all happiness, with the author's characteristic partiality for his own productions, he advised Mr Yonge to consult his book.*

Of the president and Dr Portesse, as well as Dr Charleton, he speaks in terms of the greatest kindness.

In November 1702, when he had again occasion to be in London, Sir John Hoskyns, vice-president of the Royal Society, gave instructions to Mr Haughton to bring Mr Yonge to dine with that learned body at Pontacks. He went accordingly. The secretary, Dr Hooke, told him that he must become one of the Society, as it was an honour seldom offered, and seldomer refused. Mr Yonge accepted the offer, and was duly elected on the 3d November 1702.

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* A System of Anatomy, treating of the Body of Man, Beasts, Birds, Fishes, Insects, and Plants, illustrated with many Schemes, consisting of a variety of elegant Figures drawn from the Life, and engraved on Seventy-four Folio Copper Plates. And after every part of Man's Body hath been Anatomically described, its Diseases, Cases, and Cures are concisely exhibited. Two volumes folio. By Samuel Collins, Doctor of Physic, &c. in the Savoy. London, 1685.

Mr Yonge had, previous to this time, lost his first wife; and he entered into a second matrimonial engagement with Mary Upton, daughter and heiress of William Upton of Postlynch, in the parish of Newton Ferrers. By this union, the estate of Postlynch came into the family; and continues to be possessed by the representatives of Mr Yonge.

Mr Yonge was now (1703) in the fifty-seventh year of his age; and having, as he says, obtained a good estate and more professional employment than he was desirous of, wishing to have some relaxation and enjoy his ease, he declined public business and employments. His patients this year amounted to 444, of whom 14 persons died. After this time he lived a life rather retired, though not without usefulness. The month of October in the year 1707 was signalized by the catastrophe of several ships of the fleet under the command of Sir Cloudesley Shovel striking in the tempestuous night of the 22d on the rocky coasts of the Scilly Islands. The Association, the vessel of the admiral, struck first, about 8 P.M., and every person on board perished. The body of the admiral was afterwards cast ashore and buried in the sand; but it was again disinterred and brought to Plymouth to the citadel, where, nine days after the shipwreck, it was embalmed by Mr Yonge. This appears to have been the last merely professional duty which he performed. He lived through the reign of Queen Anne, and saw George I. on the throne for five years. He died in 1721, and was interred in the old church of St Andrew, in Plymouth, where a monument, erected to his memory, shows his connection with the parish and the esteem in which he was held.

Besides the short treatise on the styptic properties of the oil of turpentine, he published a useful performance on injuries of the head, and one or two essays of less moment.

On the character of James Yonge, the account of his life now given furnishes, in a great degree, the means of forming a judgment. He was evidently a person of great vigour and energy of mind, much fortitude and firmness, and that strong determination of purpose, which enabled him not only to endure severe trials and adverse circumstances, but in some measure to triumph over them. The originality of his intellectual powers is sufficiently shown in his short treatise on the means of suppressing hemorrhage; and his whole professional career is marked by that boldness, promptitude, and decision, which distinguishes the possessor of a superior mind. His learning, which was equal to that of any of his contemporaries, was the least of his qualifications. He always writes, like a man, not only of education, but of sense, and one who had been accustomed either to hear good English spoken or to read good authors. It is in the originality of his modes of reasoning and thinking, and the soundness of his judgment, that his superiority appears. Exclusive of the testimony of the Fellows of the College of Physicians and those of the Royal Society, both of which bodies spontaneously solicited his accession to their numbers, we have the evidence of many contemporaries of competent judgment, of the high estimation in which he was held as a surgical practitioner and a man of powerful intellect. To his moral worth and excellence it is superfluous to advert. The whole conduct of his contemporaries and friends, and every passage in his life, form a constant commentary on the elevation of his character and the integrity of his life.

For the character and memory of Charles the First he had a high veneration, and wrote among others a tract to prove, that this monarch was the author of the *Eikon Basilike.* It was not to be expected that he should be indifferent to the character of Oliver Cromwell; and he speaks of the Protector in language more decided and less respectful than probably would be approved by impartial judges. Mr Yonge, in short, was a decided Royalist, and a warm adherent of the Stuart family; and it is possible to imagine the awkwardness, if not the disappointment, which he might have felt, both after 1688 and after 1715, when he beheld first the old dynasty formally and legally set aside, and subsequently, after the death of Anne, the last of the Stuarts, the Hanoverian branch of the family introduced and seated on the throne.

It must be mentioned, as an instance of the caprice of fortune, that of many who have done much less for medicine and surgery, accounts more or less full have been recorded. Of Mr James Yonge, who communicated to the Royal Society in its infant state, many facts of much pathological value, and certainly was the original author of several improvements in surgical practice, no account has hitherto been preserved. The present attempt to rescue from unmerited obscurity the name of one, who in his day was a benefactor to the science, will probably be received with favour by those who take interest in the truth of literary history, and who are desirous to see justice rendered to the memory of men, who have contributed to enlarge the amount of useful knowledge in medicine and surgery.

Note omitted in Dr Stratton's Paper, page 270.

The town of Brantford derives its name from an Indian chief who resided here; he was the son of Brandt, the chief mentioned in Campbell's Poem, *Gertrude of Wyoming.*

The Indian word *Manitou* signifies *Spirit; Manitoulin* is the *Island of Spirits*, and *Manitouwawning* means the *residence of the Spirit.*

PART II.

CRITICAL ANALYSIS.

1. *Dr Underwood's Treatise on the Diseases of Children, with Directions for the Management of Infants.* Tenth Edition, with Additions, by HENRY DAVIES M.D., Fellow of the Royal College of Physicians, Senior Physician to the British Lying-in Hospital, and formerly Lecturer on Midwifery, and the Diseases of Women and Children in St George's Hospital Medical School. London, 1846. 8vo. pp. 595.
2. *A Practical Treatise on the Diseases of Children.* By JAMES MILMAN COLEY, M.D., Member of the Royal College of Physicians in London, &c. &c. London, 1846, 8vo., pp. 467.
3. *Lectures on the Diseases of Infancy and Childhood,* by CHARLES WEST, M.D., Fellow of the Royal College of Physicians; Second Physician to the Royal Infirmary for Children; Physician Accoucheur to the Middlesex Hospital, and Lecturer on Midwifery at the St Bartholomew's Hospital. London, 1848. 8vo. pp. 488.

SINCE the time when we gave accounts of the work of Billard in the fortieth volume of this Journal,* and of that of Evanson and Maunsell, in the fifty-first volume,† various treatises of different degrees of merit have not ceased to be offered to the instruction of the profession. The useful treatise of Billard, after being illustrated with notes by Ollivier, was translated into English by an able American physician.‡ A large collection of essays and commentaries, principally by German physicians, on the Diseases of children, was published at Stuttgart, in Germany as was stated in volume fifty-first, in the three years between 1834 and 1837.[*]

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* Edinburgh Medical and Surgical Journal, Vol. xl, p. 188. Edinburgh, 1833.

† Ibid. Vol. li. Edinburgh, 1839, p. 166.

‡ A Treatise on the Diseases of Infants, founded on Recent Clinical Observations and Investigations in Pathological Anatomy, made at the Hospice des Enfans Trouvées: With a Dissertation on the viability of the Child. By C. M. Bil-

As these volumes contain many papers and memoirs on subjects of great importance, and as they seem to be imperfectly known in this country, it may be useful on some proper occasion to subjoin the titles of their contents.

The only reasonable objection, with which this elaborate compilation can be charged, is the mode of arrangement, or rather the want of methodical arrangement. It is obvious that it would have contributed much to the convenience of readers, to have all the essays and memoirs on one subject placed together, since by this plan readers would at once have formed distinct and correct notions of the total amount of information, of which they could avail themselves on each subject. Thus, all the essays on the generalities of infantile diseases should have been placed first as an introductory section; then we would have had all the essays on meningitis, water in the brain, cerebral affections in general, the hydrencephaloid disorder and convulsions placed in succession close by each other. In like manner all the papers on thymic asthma and crowing inspiration should have been placed together. So all the papers on asphyxia, bronchitis, and pneumonia in children, might with great advantage have been associated. Then all the papers on the multiplied disorders of the alimentary canal should have been united; for instance, vomiting, gelatiniform softening of the stomach, diarrhoea, griping, watery diarrhoea, cholera, dysentery, jaundice, affections involving the intestinal follicles, remittent fever, weaning brash, atrophy, marasmus, mesenteric *tabes*; in short, all the disorders that affect, either dynamically or organically, the chylopoietic viscera, ought to have been unquestionably placed together in particular orders, if the convenience of readers, and the communication of clear and comprehensive views on each disorder and class of disorders were the object. Instead of the arrangement now suggested having been followed, the different essays are reprinted without observing any order at all. For example, a paper on asphyxia is followed by one on ophthalmia, then one on inflammation of the parotid gland, and similar unconnected subjects. With this exception, nevertheless, it must be allowed, that the collection is one of great value, and contains a large amount of useful information.

Besides this collection of Essays and Memoirs, various complete treatises by different authors have appeared since this time

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lard, M.D., &c.; with Notes by Dr Ollivier of Angera. Translated from the third French Edition, with an Appendix, by James Stewart, M.D. London, Dublin, and New York, 1839, large 8vo.

[*] Analekten Uber Kinderkrankheiten, oder Sammlung Auserwahlter Abhandlungen uber Sammtliche Krankheiten des Kindlichen alters. Zusmamengestellt zum gebrauche für Pracktische aerzte, Erster Band, Heft. 1-4,. Stuttgart 1834. Zweiter Band, Heft. 5-8, 1835. Dritter Band, Heft. 9-11, 1836. Vierte Band, Heft. 12, 1837.

in one or other of the medical establishments of Germany. Thus, in 1836 appeared the second edition of a Manual on the Diagnosis and Treatment of the Diseases of Children, with the Physiology, Psychology, and Dietetic Management of the Child, by Dr J. C. G. Jörg, Professor of Midwifery at Leipzig.[*] The year 1838 witnessed the appearance of two performances on the subject; one, A Manual for the Treatment of the Diseases of Children, by Dr L. Fränkel;[†] the other, a more elaborate work by Dr F. L. Meissner, previously known by his labours in this department.[‡] Next came, in 1842, at Vienna, a small treatise by Dr Gotz, on the Management and Treatment of the Healthy and Diseased Infant during the first[§] period of Life; and then in 1843 appeared, under the name of Manual, the first volume of a species of compilation by two physicians, Dr A. Schnitzer and Dr B. Wolff,[||] professing to be according to the communications of experienced physicians.

Meanwhile, in France, M. Valleix produced in 1838, a Treatise, containing a considerable amount of information on the diagnosis, pathology, and treatment of the diseases of infants;[¶] and, as some testimony of its merit, it appeared at Berlin the subsequent year, in a German translation. The work, however, which on the whole, among foreign treatises, is most entitled to attention, is the elaborate and comprehensive performance of Rilliet and Barthez, which appeared at Paris in 1843. This work has certainly contributed greatly to elucidate and render more precise many points regarding the diagnosis and the etiological and pathological relations of the diseases of infancy and childhood; and, if the authors have not directly improved the therapeutic department, they have at least furnished to others the means of so doing. The field of observation which they enjoyed is extensive, and they have cultivated it with industry and skill, so far as etiology, pathology, and diagnosis are concerned.[**]

The three treatises now before us possess, on various grounds, strong claims to the attention of professional readers. The first is a new and much-improved edition of the work of Dr Underwood, carried forward by the successive commentaries of three able editors, so as to place the work on a level with the information of the present day. The second is a work by a physician, who has long enjoyed excellent opportunities of observing and treating the diseases incident to infancy and childhood. And the third is a series of lectures delivered by a well-informed physician, who has been at great pains to combine the results of his own experience, which are not limited, with those which have been, during several years past, added by the labours of various observers in England, France, and Germany. The respective merits of each of these works it is not very easy to specify. They are all excellent in their way; and the English reader is fortunate in possessing so many useful guides, that it becomes almost a matter of indifference, which he selects.

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[*] Handbuch zum Erkennen und Heilen der Kinderkrankheiten, nebst der Physiologie, Pscychologie, und diätetischen Behandlung des Kinder. Von J. C. G. Jörg. 2te, Auflage. Leipzig, 1836.

[†] Handbuch für die Heilung der Kinderkrankheiten. Von Dr L. Fränkel. Berlin, 1838.

[‡] Die Kinderkrankheiten. Von F. L. Meissner. 2 Bande. Leipzig, 1838, gr. 8vo.

[§] Die Pflege und Behandlung des Gesunden und Kranken Kindes während der ersten Lebensperioden. 12 geh. Wien, 1842.

[||] Handbuch der Kinderkrankheiten, Nach Mittheilungen bewährter Aerzte, Herausgegeben von A. Schnitzer und B. Wolff. I. Band, grosse 8vo. Leipzig, 1843.

[¶] Clinique des Maladies des Enfans nouveau-nés. Par Valleix. Paris, 1838, 8vo.

[**] Traité Clinique et Pratique, sur les Maladies des Enfans. Par Rilliet et Barthez, Docteurs en Medecine. Anciens internes laureats de L'Hopital des Enfans Malades de Paris, &c. Trois Tomes. Paris, 1843.

The treatise of Dr Underwood has for fully fifty years been a great favourite with the profession; and all,—both physicians and surgeons,—have borne testimony to the great value and practical character of the information conveyed in it. When it was originally published in 1784, practitioners were divided between the old though useful treatise of Harris and the diffuse work of Rosenstein.

There appeared, indeed, at London, in 1772, besides the essay of Dr Cadogan, a Treatise on the Diseases of Infants and Children, comprehended in 258 pages, short, of course, but judicious, intelligent, and sensible, well written, and with a competent amount of information on the subject. The treatise was anonymous, and probably this operated not in its favour. It seems not to have gone to a second edition, though many books much inferior to it had done so. It was much superior, both in condensation and the judgment which it evinced, to the prolix work of Rosenstein;* and unless books are to be estimated by magnitude, ought to have stood in professional opinion greatly above that of the Swedish author.† The doctrines of Rosenstein were often discredited by gross credulity and indiscriminate confidence. His style and manner, also, are gossiping, and not becoming a judicious physician, as he is represented to have been; and his therapeutic directions, however excellent for Sweden, were not suited for Great Britain. The anonymous author, on the other hand, was short, sententious, and distinct. He showed no partiality to hypothetical speculations, or the use of inert and trifling remedies. All was practical, and all bearing directly on the point.

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* The Diseases of Children and their Remedies. By the late Nicholas Rosen von Rosenstein, First Physician to his Swedish Majesty, and Knight of the Polar Star. Translated into English by Andrew Sparmann, M.D. London, 1776. 8vo, pp. 364.

† A Treatise on the Diseases of Infants and Children. London, 1772. 12mo, pp. 258.

In the transition period, as it may be called, after the publication of these works, when, in truth, there was no other guide in the field, appeared the Treatise of Dr Underwood, at first in one volume, and in no long time attracted a large share of professional notice, probably in consequence of the well known experience of the author.* It supplied wants which had been long felt, and by the recent and practical nature of its information, instructed ignorance, removed doubts, impressed caution, and inspired confidence. No great amount of science or philosophy was apparent in the work; but it was distinguished by much common sense, an adequate amount of information on all divisions of the subject of the general management of infancy and the maladies most liable to attack that tender period of life, and great discernment in the employment of suitable remedies. Plain also and homely in style, almost to carelessness, the author stated only what was necessary and no more; and as readers obtained in general the information wished for, they were not displeased with the simple manner in which it was communicated. A disagreeable sight to any one of education was assuredly the careless and erroneous manner in which the orthography of proper names was often given. Yet were these deficiencies all compensated by the genuine merits of the work.

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* It forms a subject of considerable curiosity in a psychological point of view, to consider that the mental faculties of the author of this estimable work underwent, not long after the appearance of the 4th edition, a sort of partial obscuration and eclipse, from which they never afterwards fully recovered. According to the editor of the Diary of Dr Underwood, this mournful affliction took place some time about the end of the 18th century or the beginning of the 19th; and in consequence of it, he determined in 1801 to withdraw himself entirely from all public business, and spend the remainder of his days in entire seclusion from society. Dr Underwood was born in 1737, and was consequently at this time in the 64th year of his age. The accession of this severe calamity is ascribed by the editor to "an accumulation of domestic afflictions," causing a high degree of nervous irritation, "which, acting on a frame naturally weak, produced a dreadful depression of spirits;" and Dr Underwood consequently "imagined himself incapable of discharging the arduous duties of his profession." On this may we be permitted with all delicacy to make one or two remarks.

It clearly results from various passages in the diary of the author, that though his mind was in many respects sound, it was not so in all; that this, though it was the first very serious attack, unfitting him apparently for the duties of active life, was not the earliest attack of mental disorder. The diary, on the other hand, affords distinct evidence, that his mind, though generally vigorous and good, and not affecting the intellectual faculties, was nevertheless not in a healthy and well-balanced condition, so early as 1771, when he was in the 34th year of his age, and probably previous to this time. On the 26th June 1771 he addressed to Mr Romayne, then minister of the Independent congregation in Blackfriars, a letter which shows that he was labouring under a peculiar form of religious melancholy. This letter shows something analogous to the movements and distress exhibited by one period of the lives of Bunyan and Cowper; but it is more desponding, shows greater wretchedness, and a more hopeless degree of alarm and fearfulness. He beseeches Mr Romayne to pray for him, if he cannot comfort him; to consider his case; and to bear in mind that his great complaint is, that he cannot see the guilt and heinousness of sin, and that his great enemy is a particular form of unbelief.*

With regard to domestic affliction being the cause of this calamity, the answer must be,—that affliction, however severe, is rarely the cause of such disorder in the mental faculties, in minds otherwise well constituted. It is clear, that were this the case, derangement and especially melancholy would be much more frequent than they are. None of the human race have any right to expect to get through life without suffering domestic affliction; and the proper effect is most commonly to give the mind greater firmness and fortitude, and to detach it from excessive fondness for the affairs of this life; and this it usually does in minds under the influence of religion and philosophy. On this subject, of course, different opinions may be entertained by different individuals.

The most curious part of the history of this worthy person, however, is the fact, that the work might probably have been written under some degree of this state of mind; and that certainly several editions of it were published while the author was still mentally suffering. In May 1808 he speaks as if he was better, and uses the terms, "since my recovery;" and he was then evidently in a more tranquil and comfortable frame of mind. Meanwhile, between 1789 and 1805, four editions subsequent to the first had been published, all apparently during the time that the faculties of the author were labouring under a partial degree of obscuration.

* Extracts from the Diary of the late Michael Underwood, M. D., 12mo. London, 1821.

In the course of twenty years this work went through five editions,—an unequivocal proof of its merits; in 1811 appeared the sixth edition, and in 1819 the seventh edition,—the last during the lifetime of the author. So firmly was the work of Dr Underwood fixed in professional estimation, that the idea of attempting to supplant it by any new performance on the same subject, seems either not to have been entertained, or, if entertained, to have been speedily abandoned.

It seems scarcely possible to doubt, that this idea operated, along with the acknowledged merits of the book, in inducing Dr Merriman to publish, in 1827, an edition of the work of Dr Underwood, with various additions and commentaries, accommodating the treatise to the time at which it appeared.* The work, introduced under auspices so favourable, continued to maintain its character.

By Dr Merriman many beneficial changes were introduced. Errors in expression were corrected; superfluities in language were retrenched; the general redundancies of the author's style were curtailed; and the whole work was condensed; while numerous notes and observations, rectifying and improving principles and practice, were everywhere added. The dissertation on the chemical and dietetic properties of milk was removed, as incorrect, obsolete, or otherwise unsuitable. That part of the matter of the third volume which related to the management of infants, was transferred, in a condensed form, to the first, where its posi-

These remarks which we have been led to make, from the respect in which we have always held the work of Dr Underwood, are merely intended to throw some light on a subject of great obscurity and not void of interest, the co-existence of a degree and form of mental disorder with soundness and correctness of judgement, as well as energy on other topics.

* A Treatise on the Diseases of Children; with Directions for the Management of Infants. By the late Michael Underwood, M.D., &c. The Eighth Edition, revised with Notes and Observations, by Samuel Merriman, M.D., F.L.S. London, 1827. 8vo, pp. 636.

tion fitted it for a general introduction to the whole treatise. In short, to Dr Merriman must be ascribed the merit of new-modelling the work of Dr Underwood, and thereby accommodating it to the time and the readers before whom it was to appear.

Ten years subsequently,—in 1837,—it received, from the experience of Dr Marshall Hall, a new accession of illustration and exposition, forming the ninth edition ;* and in the present edition a physician of great experience and judgment has published the work with the additions and comments of his two predecessors, and those which his own observation has enabled him to add. The work of Dr Underwood, therefore, has been, by the labours of successive editors, brought forward and accommodated to the state of medical knowledge at the present time.

It is certainly a very strong proof of the merit of a work of this kind, that it continued for more than one-third of a century to be the general and only authority on the diseases of children; and that, after the death of the author, it has been thought worthy to be republished three times successively by three eminent and well-informed physicians. The additions made by these three commentators are all embodied in the present edition; and it would be unjust to omit saying, that while the practical observations of the first two are of great value, those of Dr Davies show, that he has been at great pains to introduce all the most approved information, which the labours of the last ten years have placed within reach. From the reports of the Registrar-General in particular, he has introduced a considerable proportion of statistical information, which cannot fail to throw much light on the diseases most prevalent and most dangerous and destructive to the lives of infants and children.

The general arrangement of the treatise of Dr Underwood has been more or less closely retained. In various places, however, information which had either in the lapse of years become of questionable accuracy, or, though not incorrect, more or less useless, has been removed, and in its place more useful and recent matter has been substituted. Various interesting cases we observe introduced under different heads, especially by Dr Marshall Hall and Dr Davies. All these changes may have impaired a little the unity of the work; but they have certainly increased very much its usefulness as a guide to the practitioner. The volume must be regarded as on the whole so complete, that it may most justly be recommended as a safe and useful guide to all practitioners wishing to understand the peculiarities of the disorders incident to infancy and childhood, and the best methods of treating these disorders.

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* A Treatise on the Diseases of Children; with Directions for the Management of Infants. By the late Michael Underwood, M.D. The Ninth Edition, with Additions, by Marshall Hall, M.D., F.R.S., and Samuel Merriman, M.D., F.L.S. London, 1837. 8vo.

The second work on the list is, as has been said, by a physician who has enjoyed lengthened experience in observing and treating the diseases of children. At an early period, namely in 1813, Dr Milman Coley published an essay on Remittent Fever of Infants, which showed much talent for observation, and considerable judgment in the management of the diseases of infancy. Dr Milman Coley has, since that time, not been idle or inactive; and the present volume shows the result of his labours. The work is not, properly speaking, divided either into chapters or sections. But there is a division and arrangement of the subjects considered; and its order may be understood from the following enumeration.

First, after an Introduction, which is rather a Preface or Advertisement, are considered diseases connected with the separation of the umbilical chord; then comes *cephalæmatoma* or the bloody tumor of the scalp, which is not very properly considered as the same as *hydrocephalus externus.* Next follow the short or adherent *frænum* of the tongue, imperforate anus, club foot, and other distortions. Diseases of the eyes, and those of the eyelids, are next considered. Then hydrocele, indurated and tumid breasts, and jaundice are shortly considered.

Diseases of the skin are considered under eight orders, from page 54 to page 124.

Then come the diseases of the alimentary canal under the separate and successive heads of Diseases of the Mouth and Pharynx; Diseases of the Œsophagus; Diseases of the Stomach; Diseases of the Bowels and their coverings and appendages, and intestinal worms;—p. 125 to 236.

The next subject considered is that of Diseases of the Respiratory Organs and Pulmonary Consumption; and then Diseases of the Heart, including Kyanosis;—p. 237 to 346.

Then follow Diseases of the Liver, and Diseases of the Kidneys, and of the Bladder, Urethra, and Vagina, and their appendages;—p. 348 to 368. Then is given some account of diseases of the Thyroid Gland.

These are followed by Diseases of the Cellular Membrane and Erysipelas in Infants; Diseases of the Ear; Diseases of the Joints; Acute Rheumatism and Gout; Burns and Scalds; Chilbains; the management of Hemorrhage from Leech bites, and the treatment required for Warts and Corns, p. 371 to 407.

Then come Diseases of the Brain and Nervous System, and Convulsions; and the volume is concluded by some observations on Specific Diseases, including Scrofula, Karkinomatous Diseases, and the Keloid Disease, Rickets, Syphilis, and Scurvy.

In his description of diseases and their treatment, Dr Milman

Coley has aimed much at brevity, and rendered his delineations and directions as brief as may be consistent with perspicuity. The book is well-suited, by its practical character, we must say, for country practitioners, and those who have on their hand little spare time; but were each division numbered in chapters and sections, and subsections, it would facilitate reference and consultation.

The third work in our list is one which, on many accounts, is entitled to considerable attention. It is evident, that the author, who enjoys excellent opportunities for studying the diseases peculiar to infancy and childhood, has been at great pains to present correct views of their peculiar features and characters; that he has been anxious to instruct his auditors and readers in the difficult duty of diagnosis; and that, in every thing relating to the pathological tendencies of different diseases in infants and children, he has been studious to furnish the best evidence attainable, as the only rational foundation for efficient treatment.

The work is in the form of Lectures, which were delivered at the Middlesex Hospital in the summer of 1847. The form is fashionable, though it may be doubted whether it is so favourable for methodical arrangement and condensation, as if the subjects had been treated according to their natural affinities. This, however, is no proper reason for censure. The work is interesting and instructive; and in that case, the external disposition of the materials is of little moment. The whole volume consists of thirty-nine lectures, in which the several subjects are treated in the following order:—

In the first Lecture, which is of a general nature, the author considers the peculiarities presented by the diseases of infancy and childhood, and the difficulties attending the study of these diseases, gives rules for examining children in sickness, and for taking histories of the symptoms, and explains the objects and general plan of the course. The general order then adopted may be shortly stated in the following manner:—I. Diseases of the Brain, Spinal Chord, and Nervous System. II. Diseases of the Organs of Respiration and Voice. III. Diseases of the Heart. IV. Diseases of the Organs of Digestion and Assimilation. V. Abdominal Tumours. VI. Fevers; and VII. The Acute Cutaneous Diseases. On all these different subjects the author communicates a large amount of instructive information; and the work will be perused with great interest by all who wish to obtain precise and accurate views on the nature of infantile diseases, their distinctive characters, and the methods of treatment that promise the most beneficial results.

It is not our intention to enter into any detailed account of the contents of these three volumes. We shall merely advert to the subject of diseases of infancy and childhood in a general manner; and in so doing, notice only the most new and most important points, since the subject was considered at sufficient length, and with becoming amplitude, in the account which was submitted of the work of Messrs Evanson and Maunsell in the fiftieth volume. We adhere to the order observed by Dr West, without pretending to give any opinion on the merits of that order, merely because it is on the present occasion most convenient.

Diseases of the nervous system, and especially those affecting the brain, are probably the most frequent causes of sickness and mortality in the early period of life. From the Fifth Report of the Registrar-General, it results, that of 45,000 persons who died in the Metropolis during the year 1842, 7,503 were destroyed by various diseases of the nervous system. Of this number of 7,503, 4,847 took place during the first five years of existence; in other words, 64 per cent. of the fatal disorders of the nervous system occurred within that period. According to the statements given in the Eighth Annual Report, the most recent, it results, that the total mortality from all causes at all ages, among males, was, during 1845, 24,496, and among females, 23,836. The deaths among males below five years of age amounted to 10,410, of which 2,554, or more than one-fourth, were by diseases of the nervous system; and of these, convulsions form 1,292, fully one-half. The deaths among females under five years of age, amounted to 9,477; and of these, 2,049 were by diseases of the nervous system; convulsions (1049), forming of these also more than one-half. For 1846 the mortality from this cause stands in the following position. The total mortality of males in the metropolis, from all causes and at all ages, was 24,941; and among females, 24,148. While among the former, the total deaths under five years of age amounted to 10,434, those by diseases of the nervous system amounted to 2,351, of which convulsions formed 1,105, or not quite one-half. Among females under five years of age, the total deaths amounted to 9,340, and those by diseases of the nervous system amounted to 1,859, of which 928, exactly one-half, were by convulsions.

Dr Nasse of Bonn has given from various sources, in a useful essay on the frequency of dropsy of the cerebral ventricles in children, and its great mortality, some facts regarding the mortality from this cause abroad. According to the Report of Dr Mükish, upon the sick children, treated in the second Institute at Vienna for infants, among 56 children dead, nine, or one-sixth, died in consequence of acute hydrocephalus. Bouvier calculates that at Paris, upon an annual average, 750 children die of acute water in the brain. If this be correct, it is a large proportion for that disease; as in London, with a population of at least two millions, the total deaths by this disorder are 884 males and 648 females, or 1532 of both sexes. At the period referred to, 1824, it may be doubted if the population of Paris exceeded 700,000. Coindet calculates from the proportions given by the Mortality Registers of Geneva, that in the whole of France water in the brain destroys annually from 20,000 to 24,000 children. Of course, the number must, since that time, have been very greatly increased, as the population has been augmented.

At Berlin the mortality is perhaps not so great. According to the Berlin Mortality Registers for 1833, among a total mortality of 7948 persons, 4009 were children below ten years of age. Among these 4009, only 112 died of water in the head and dropsy of the brain, and 86 from inflammation of the brain. It is to be observed, however, that the Berlin Register presents a title or head of spasms or convulsions extending through all the years; and this for 1833 contains 942 deaths.

In the city of Cologne, the Mortality Registers for 1831–1832, present, among 4940 deaths, those of 1973 children below 14 years of age; and of these, 18 deaths were by dropsy in the brain, 21 by inflammation of the brain, and 516 are ascribed to convulsions.

Dr Nasse very properly observes, spasms and convulsions are a mere symptom; and that symptom suggests the question, to what morbid state is it referable? Upon this question, however, he observes, the Registers, as constructed, throw no light. This explanation, therefore, must be sought from sources in which the actual morbid states are designated as the causes of death. We shall possibly see afterwards the means adopted by Dr Nasse to determine this point.

Meanwhile, it may be proper to observe, that Dr Nasse calculates, from various data which appear to be correct, that in the whole Prussian States, if there die annually 160,000 children, at least 32,000 of these are destroyed by water in the brain. He allows that this number may appear singularly great. But various circumstances induce him to think that the number is not overrated. He admits that in some years the numbers of children destroyed by water in the brain may be smaller; and in certain months the disease may be less violent than in others. But when the lists are inspected over a long series, they will in general give the same proportion.*

Believing this great predominance of disease of the nervous system in the first years of life to be quite real, Dr West ascribes it to two circumstances; first, the activity of the circulation and nutrition in that part of the frame as connected with rapid and early development; and secondly, because the brain is exposed to more extensive variations in circulation in early than in adult life;

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* **Analekten Ueber Kinderkrankheiten. Zweiter B. 6tes Heft, S. 35–41.**

which again must be referred, we understand, to the more intimate connection between the states of other organs, especially the liver and alimentary canal, and those of the circulation and the nervous system.

Regarded as a symptom, convulsions in infants, Dr West thinks, correspond in a large proportion of cases to delirium in the adult. In early life, the chief function of the brain is the superintendence of motific power; and hence the accession of convulsions does not import that any new disorder has attacked the brain, but simply that the disease is so serious as to derange the regular performance of the functions of the organism. Convulsions at other times take place in infancy, not as the result of any permanent disease of the brain, but in consequence of those anatomical peculiarities which allow congestions of this organ to take place more suddenly, and to greater amount in the infant, than in the adult. Such, probably, are the convulsions taking place in hooping-cough, and the incipient fever of small-pox.

The great reason of the frequency of convulsions, he, however, allows to be the predominance of the spinal over the cerebral system in early life, and the multiplied irritations acting in the reflex manner, upon the spinal chord. But, independent of this cause, it is certain that the brain may be thrown into a state of active congestion, and consequently irritated, either by the amount of blood or by something wrong in its qualities, at the time of teething, from exposure to the sun, from the effects of a blow on the head; or a state of passive congestion may be induced by mechanical impediments to the return of blood from the head to the heart; from languid circulation; from something in the blood which ought not to be there, as in the case of the want of pure air, or from food neither of nutritious quality nor sufficient in amount.

This liability to the occurrence of congestion in the brain, the author illustrates by referring to the facts given by Dr Mauthner of Vienna, who, on examining the bodies of 229 children dead of various diseases, found in 186, traces of a congested state of the vessels of the brain. It may be doubted, nevertheless, whether correct inferences regarding the presence and degree of congestion can be deduced from facts collected in this manner. A congested or overloaded state of the cerebral vessels is so common in the concluding period of all disorders, as an effect of the mode of death by the lungs, that it cannot be received as a proof of mere congestion of the brain, without other circumstances being taken into account. It is indeed either a consequence of the obstructed state of the circulation during the latter hours and minutes of life, or it is partly cadaveric. It is not meant by stating this caution, nevertheless, to deny the fact of the great liability of the brain to vascular congestion in early life. All that is here meant is, that the appearances often in the dead body taken for that state, depend upon different causes.

In active congestion of the brain, the best remedies are laxatives or occasionally purging, the application of cold to the head, and bleeding, general and local, according to symptoms and effects. All these remedial measures, however, require to be employed with caution and judgment. Thus, the application of cold may be too strongly sedative; the purgatives may act too violently; and blood-letting may be carried further than the strength of the infant permits. For all these possible evils, the great thing is judgment, discrimination, and caution.

In the passive forms depending on the persistence of hooping-cough, and the impure air which the child is obliged to breathe, the author recommends depletion cautiously, and the moderate use of mercurial purgatives, with the occasional use of the hot salt-water bath or the sinapised bath. Making the child breathe fresh air, and the occasional use of laxative doses of oil of turpentine, are, in this form of cases, very excellent remedies.

Hemorrhage within or upon the brain, or into its substance, is not a common lesion in infancy. But this is true only as to hemorrhage from distinct vessels and trunks. Capillary hemorrhage may take place, and is an affection not uncommon in new-born infants, and may then become a cause of what is called *asphyxia neonatorum*, or *apoplexia neonatorum*. The cause of this is not always well ascertained. Of course, a ready cause to the minds of many will occur in the long-continued and general pressure to which the head of the child is subjected during the process of parturition. This Dr West regards as a real and common cause; and, doubtless, it is not unfrequent. At the same time, it must be observed, that, according to the researches of Cruveilhier, who has examined this kind of lesion carefully, it is not in all cases possible to trace it with certainty to the cause now specified.

The stages and degrees of the lesion are various, as may be the seats. The capillaries of the brain and *pia mater* may be simply distended in various degrees with a large quantity of dark-coloured blood. Blood may be effused into the delicate filamentous tissue between the arachnoid membrane and *pia mater*, in moderate quantity. Blood may be effused in considerable amount. Blood may be effused from the vessels connecting the *pia mater* to the convoluted surface of the brain, covering the whole surface to a considerable extent, but especially the upper and lateral parts of the hemispheres and the base of the brain and *cerebellum*. Blood may be effused within the ventricles. The same changes may take place in the spinal chord, the surface of which may be more or less extensively covered with blood, constituting then *apoplexia spinalis*.

The effects of this lesion are lividity of the surface of the body, and especially of the face, cessation or feebleness of the beats of the chord, cessation of the beating of the heart, no appearance of respiration,—in truth, all the phenomena of apparent death. In less severe and advanced cases, a few efforts at respiration are made at long intervals, and the spasmodic twitchings of the muscles of the face, with the closed state of the fingers and hands, are the only remaining marks of life. If breathing come on actively, and if the child cry, sometimes vital action is established. Unless, indeed, breathing be established, the child is, to all intents and purposes, dead. In intense cases, this takes place without any appearance of convulsions. But if breathing be established for a time, and not permanently, convulsions generally terminate the life of the infant.

This lesion must be regarded as a common cause, if not one of the most common causes, of what is called still-birth. It is much more important in a medico-legal than in a therapeutic point of view. The appearances of hemorrhage on the surface of the brain, and between the membranes, have been, and may be, ascribed by rash and ignorant persons, to injury and violence inflicted on the head of the child after birth. It perhaps cannot be justly asserted that the hemorrhage is not the effect of violence; but it is not the violence meant or designated by the law. It is the violence resulting from the head of the child being either very forcibly or too long compressed, during parturition, against the bones of the pelvis. Most commonly, also, it is connected with a bad and unfavourable presentation, as the feet, the nates, or the shoulder.

It is only in the most favourable cases that it can become the object of treatment. But, as the favourable characters of these cases cannot be determined except by trial, it is proper, if the labour have not been tedious and protracted, to attempt means of re-animation.

When the accident does take place, and when there is reason to believe that the cause is over-distension of the capillary vessels of the brain and its membranes, yet without extravasation, the first indication is to relieve this distension by allowing about half an ounce or one ounce of blood to escape from the vessels of the chord. Next to this is placing the child for one minute or two,—not longer,—in a hot bath,—the author says at 100° or 102°,—while cold water is dashed on the head, face, and chest. The great remedy, however, is artificial respiration.

This is one of the most ordinary forms of still-birth. Some judicious observations are given in the work of Dr Underwood. But we wish that some of the editors had removed entirely the direction regarding the use of the tobacco-smoke injection.

In cases in which much blood is effused, or indeed any blood is effused, we believe that all attempts at resuscitation are ineffectual.

A less unfortunate result of long-continued pressure on the head during parturition, is the formation of the bloody tumour of the scalp, or what has been named *cephalæmatoma.* In general, this appears a few hours after birth, and if to appear at all, it is seldom later than forty-eight hours after birth. Its usual situation is on one or other parietal bone, most commonly the right, in the shape of a soft elastic swelling, slightly fluctuating, yet with circumscribed margin and outline. It is void of pain. It is usually bounded by a firm ridge, often taken for bone, which encircles it completely, more marked at one part than at another. At first appearance, the tumour is usually small; but it enlarges rather rapidly,—that is, in the course of two or three days,—to the size of a chestnut, half a hen's egg, or half an apple. As it increases in size, it generally becomes more tense, but still appears to cause no pain. The health of the infant appears not to be affected by it. After remaining stationary for some days, the marginal ring or border appears to become more distinct. The tumour then appears to be slightly diminishing in size; and this diminution proceeds for from four to six weeks; at the end of which time it is usually gone, without leaving any trace behind it, except a slight degree of prominence of the skull at the point which it occupied.

It seems established, that whatever be the remote causes of this tumour, it is occasioned proximately by blood effused between the pericranium and the outer table of the skull; that this effusion causes detachment of the pericranium for a certain space; that at the margins of this detachment a very slight degree of adhesive inflammation takes place, the effect of which is to limit the further effusion of blood and the further detachment of the *pericranium;* and that this may be attended with a slight degree of ossification along the marginal line of the tumour. Such traces of ossification are occasionally seen on the skulls of infants and children long after the tumour has disappeared.

The most recent foreign authorities on the nature and causes of this tumour are Dr Paul Dubois of Paris, and Dr Karl Wokurka of Rastadt. Both have taken considerable pains to show that the remote cause usually assigned, named the difficulty of the labour and the pressure of the pelvic bones on the head, during the contractions of the womb, by no means holds good even in a small proportion of cases. Thus, Siebold, Michaelis, Naegele, Schmitt, Palletta, Klein, Zeller, and Höre, all agree in this, that the bloody tumour of new-born infants has been observed to take place, particularly after easy labours, during which the head of the fœtus was not exposed to any remarkable pressure. Naegele, who had seen 17 cases of the tumour, has never observed it after one difficult labour. He observed it once after a foot-presentation, and Meissner and Hüter have made similar observations. Naegele consequently draws from his observations the inference, that the bloody tumour of the head has no connection with the difficulty or the tediousness of the process of parturition. This view Dubois is inclined to adopt, and in other respects ascribes the tumour to detachment of the *pericranium* and *dura mater* from the parietal bone.

Dr Wokurka is more successful in subverting the speculations of his predecessors on the causes of this effusion than in making his own explanation intelligible. All that we learn, as the result of his reasoning, is, that the tumour depends not on one cause, but on several; that it is connected with whatever may induce extension of the soft parts covering the skull,—any causes, in short, through which the vessels may be detached, and allow their blood to escape.*

The bloody tumour should be distinguished from hernia of the brain.

It is an affection not necessarily dangerous; and indeed it generally disappears without any remedies in the course of five or six weeks. Dr West recommends the use of an evaporating lotion, and gentle compression by means of slips of plaster.

There is often at the same time an internal swelling; and if this increase, it may cause unpleasant symptoms. Yet little can be done; and probably the best plan is to do little.

Hydrocephalus appears in infants and children under three forms; the first, meningeal inflammation, mostly acute, that is, running its course in from one week or less, to three weeks; the second, tubercular *meningitis*, a subacute or chronic disorder; and thirdly, chronic hydrocephalus.

Acute *hydrencephalus*, though not always distinctly marked, either in its accessions or its symptoms, is nevertheless distinguished from the other two forms by various characters. It is more rapid in approach, and sometimes appears suddenly, giving its first indications in the form of a fit of convulsions, or more or less violent pain in the head, causing the child to scream and cry, preventing sleep, and making him restless, and at stomach sick, and incapable of taking or retaining food.

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* Bemerkungen uber die Entstehung, Erkenntniss und Heilung der Blutgeschwulst am Kopf neugeborner Kinder. Von Dr Karl Wokurka. Bezirksarzte zu Rastadt. Analekten Ueber Kinderkrankheiten. Zweiter Band. Stuttgart, 1837. Heft viii. s. 30, Art. liii.

In this form fluid may or may not be contained within the ventricles. Its presence appears not always necessary to cause the fatal termination, which may take place before fluid has been effused. But the membranes are thickened and rendered opaque, and dry on their surface. In 28 among 30 cases in which death had taken place under symptoms of acute *hydrencephalus*, Dr West found an appreciable quantity of fluid within the ventricles; in 26 of these cases it was considerable, amounting, he states, to several ounces. This seems a large estimate; and it is probably correct; as the author gives in one case 3 ounces, in one 4 ounces, in one 6 ounces; and in four cases a considerable quantity (p. 53). One ounce is a great deal to be contained within the ventricles in infancy; and two ounces is probably the most common extreme limit. The most usual change, however, is more or less softening of the central portion of the brain. The *fornix*, *septum lucidum*, *corpus callosum*, and the parts forming the posterior horn of the lateral ventricles, are most frequently softened, pulpy, and disorganized. The *optic thalami*, *corpora striata*, and lower parts of the middle and posterior lobes, come next in this respect. The anterior lobes are seldom softened. Often the convolutions are infiltrated with serous fluid, which oozes from them when they are divided by the knife.

The author thinks that it is not doubtful that this softening is the effect of inflammation, and not of the mechanical maceration by the fluid. The most rational view appears to be, that it is at first the effect of the inflammatory process, but that, as the fluid is effused and increases in quantity, it necessarily separates parts already softened, and detaches and tears them from their connections, while it disintegrates to a degree still greater, all those parts which have been already softened by the inflammatory process. The mechanical idea of gravitation seems quite inadmissible, as the superior parts of the brain are often more softened than those which are inferior. Herrich, in his recent work on water in the brain, states, that among 71 instances in which serous fluid varying from 3 to 11 ounces were contained within the ventricles, central softening existed in 47 cases; that is, about two-thirds.

Another change, in some degree the opposite of this, is opacity and toughness of the *epithelium* or lining membrane of the ventricles. In some cases even it may be thickened, and in a few instances it is granular. But probably the latter change is connected with the tubercular form of the disease.

In various instances, the acute form of the disease may be complicated with the presence of tubercles, either in the substance of the brain or growing on the membranes.

The French writers have so thoroughly adopted this view, that most of them within the last nineteen years, namely, since 1827 and 1830, have considered tubercular *meningitis* as exactly the same disease as acute *hydrencephalus*; and by the most recent, and perhaps the most accurate authorities, MM. Rilliet and Barthez, this identity is completely and distinctly announced.*

Though we call not in question the accuracy of observation of these authors and their predecessors, as applied to France, we cannot say that in this country the facts observed have tended to confirm the conclusion. Tubercular deposition on the membranes of the brain we have seen along with *hydrencephalus;* but we have also seen the latter disease, without any appearance of tubercles, either in the brain or on its membranous coverings. The present author, Dr West, seems partly to adopt the view of the foreign observers, partly to be neutral. Tubercular deposition, or the granular appearance of the cerebral membranes, he recognizes as another element besides mere inflammation, in the production of acute hydrocephalus; yet he says nothing as to whether it is a uniform and necessary concomitant, or only an occasional and adventitious adjunct. The view which we think the facts observed in this country warrant, is this. Acute *hydrencephalus* is most commonly an independent disease of the membranes of the brain, an affection of these membranes more or less inflammatory, and passing through its several stages, without necessarily being attended with the formation of tubercles. On the other hand, tubercular deposits may be formed in various parts of the cerebral membranes, especially those investing the upper and lateral parts of the hemisphere, the *cerebellum*, and various parts of the base of the brain, for instance, the protuberance; and the natural course of this formation of tubercular granules is, to derange the circulation of the membranes, to compress the vessels, and to produce the effusion of serous fluid from these membranes, on the surface, and within the ventricles of the brain. This disease is slower in progress, and more protracted in duration, and altogether a more lengthened process, than that of acute hydrencephalus. The first stage appears, so far as can be judged, to consist in the formation of tubercles, which certainly occupies weeks, probably, in some cases, months. The external symptoms are at this period neither well-marked nor urgent. Often indeed, they are so obscure, that they may be said to be latent. It is only after these tubercular granules have been formed for some time, that their presence deranges the cerebral and meningeal circulation to such a degree, as to give rise to conspicuous and urgent symptoms, which then are very much those of what English physicians denominate the second and third stages of *hydrencephalus.*

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* Meningite Tuberculeuse, Hydrocephalie aigue des auteurs. Rilliet et Barthez. Tome III. p. 492.

The most perplexing part of all this inquiry is, that all the French authorities allow that the formation of these granules and tubercles in the membranes of the brain, is not due to inflammation. Yet they allow that *hydrencephalus* is an acute and inflammatory disease. Dr West himself admits, that the abundance of these granular deposits is not in proportion to the amount of inflammatory mischief; and that they are met with in certain cases, in which no head symptoms were observed during life, and unconnected with any signs of inflammation discovered after death. Surely these admissions are equivalent to saying that these deposits are not necessarily connected with acute *hydrencephalus.* Was it ever known that one case of the disease called acute hydrencephalus presented during life no symptoms of disorder of the head? If cases of this description occur in any considerable number, then the point may be conceded. But as hydrencephalus, though an insidious disease in its origin, is invariably known in this country to manifest its presence by symptoms, which cannot be overlooked by the most careless practitioner, and to which we have seen both parents and nurses remarkably sensible,—the difference furnishes an inconsistency which it is impossible to reconcile or explain; and we think, that it is safest to adhere to the doctrine which we have hitherto laid down, namely, that there is one form of disease of the cerebral membranes tending to the production of serous fluid within the ventricles, and causing other disintegrating effects, and which does so independent of the presence of tubercles in these membranes; and another form consisting in the development of tubercles in these membranes.

Further, tubercular disease in the membranes of the brain, though not unfrequent, is by no means so common a disorder as acute *hydrencephalus.* Rilliet and Barthez admit that meningeal tubercles are more rare than those of the pleura and peritonæum. It is difficult exactly to ascertain the comparative frequency and rarity of tubercular disease of the pleura and peritonæum. But we think that the experience of all medical practitioners in this country will concur in proving this fact, that tuberculation of the pleura and peritonæum are much less frequent diseases than acute hydrocephalus. If this be admitted as a correct inference, then it must follow that tuberculation of the meninges is still more uncommon than acute hydrencephalus.

It is necessary to observe, nevertheless, that one mode of explaining, if not reconciling these discordant statements, is furnished by MM. Rilliet and Barthez. These authors, in treating of what they term the secondary lesions of the meninges, commence with the following proposition: "Inflammation of the meninges is frequent in tuberculous subjects; and by one of those coincidences, the cause of which it is difficult to discover, this inflammation is developed, whether there be at the same time tubercles in the meninges, or these membranes are entirely void of tubercles, while they are observed in other organs. In this case, nevertheless, *meningitis* presents such characters that it is impossible to consider it as separate from tubercular *meningitis*, and that it must be regarded as a mere variety of that disease. The proof of this is found in the nature of the products of inflammation and in the symptoms." They then proceed to remark, that the details of morbid anatomy to be given are common to both forms of *meningitis;* that is, *meningitis* with tubercles in the *meninges*, and *meningitis* of tuberculous subjects, though the tubercular product be observed neither in the membrane nor in the brain.*

From this admission, therefore, it results, that *meningitis*, that is, the inflammatory state of the cerebral membranes which terminates in *hydrencephalus*,, does take place without the formation of tubercles either in the cerebral membranes or in the brain; yet, though without these bodies, it must be denominated and regarded as tubercular *meningitis*, because tubercles are found in other organs of the body.

Now, upon this we have merely to offer the following remarks. *Hydrencephalus*, or acute water in the brain, though a very unmanageable and frequently fatal disease, is certainly not invariably and always fatal. We are confident that we have seen cases recovered from or cured. The observation of the authors above referred to, evidently applies to fatal cases only; and it may be admitted that in fatal cases tubercles may be found in other organs, for instance the lungs, or in the peritonæum. In cases terminating favourably, we have all the evidence of which such a question admits, that in other organs there were no tubercles, since these ominous bodies did not appear to produce in such persons their characteristic and final effects. The inference, therefore, that in this class of cases, in which the presence of the usual symptoms is sufficient to prove the nature of the disease, there are tubercles or there ought to be tubercles, or the disease is of the nature of tubercular *meningitis*, appears to be gratuitous and not well-founded. In truth, if the inference as it stands,—namely, that *meningitis* takes place in persons in whom there may be tubercles in other organs, or rather a disposition to the formation of these bodies in other organs, yet without the actual formation of tubercles in the cerebral membranes,—be received in any way, it states nothing more than what has been long known to English physicians, which is that hydrocephalus takes place chiefly in those of strumous habit, and who are in other respects prone to the formation of tubercular diseases.

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* Traité Clinique et Pratique des Maladies des Enfans, par Rilliet et Barthez, D.D. M.M. Tome Troisieme, Chapter xii. Art. iii., p. 482. Paris, 1843.

When the disease takes place in the cerebral membranes, it occurs in one or other of the following forms:—1. Yellow granulations; 2, gray granulations; 3, miliary tubercles; 4, tubercular patches; 5, cretaceous or chalk-like tubercle; and 6, softened tubercles. Those most commonly seen are the yellow granulations and the miliary tubercles. The grey granulations or the tubercular patches are rare.

In the early stage, those granulations appear like small opaque spots, of a dead white colour, flat, hemispherical, much smaller than the head of a pin, and communicating no perceptible roughness to the membrane. This appearance is mostly observed in the arachnoid, covering the cerebellum and those parts of the brain, where the arachnoid membrane is stretched across from one part to another of the organ. The yellow granulations appear in the form of minute flattened hemispherical bodies, of the size of a pin-head, or smaller, of a yellowish colour, and friable under pressure. These occupy most commonly the cônvexity of the brain, on each side of the hemispheres, and generally follow the course of the vessels that are ramified in the *pia mater*, and consequently are situate in the *sulci* between the convolutions more frequently than over the apices of these bodies. They may hence sometimes escape notice. The gray granulations appear in the form of gray coloured bodies, semi-transparent, firm, and resistent, resembling much the gray granulations occasionally seen in the lungs and pleuræ of phthisical subjects. These firm gray-coloured bodies are mostly seen, according to Dr West, about the protuberance, or imbedded in the *pia mater*, in the neighbourhood of the optic nerves, or projecting from the surface of the membranes which cover the *medulla oblongata*. They are also, he adds, deposited in the arachnoid membrane, lining the occipital bone, and are then sometimes collected in considerable numbers around the *foramen magnum*. Granular bodies, sometimes of a gray, sometimes of a yellow colour are met with, though less frequently, in the substance of the *velum interpositum*, or imbedded in the choroid plexus; and in both of these situations they are sometimes very abundant.

Not always, however, do these bodies retain the appearance of granules. Sometimes, on separating two folds of the arachnoid membrane, which seem to be agglutinated together by an effusion of yellow lymph, or concrete purulent matter, the matter forming these adhesions, Dr West states, is found not to be homogeneous, but to consist of an aggregation of minute granular bodies, connected together by the lymph or pus in which they are imbedded. At the convexity of the brain, and close to the longitudinal fissure, and rather nearer its posterior than its anterior extremity, is often observed the appearance of a strip of this yellow matter, half an inch long, by two or three lines broad, connecting together the two hemispheres of the brain and the two surfaces of the arachnoid membrane. Sometimes two or three deposits of this kind are observed at the convex surface of the brain. But, in general, they are more extensive at the base of the organ, where they occupy the longitudinal fissure, and the fissure of Sylvius, and frequently connect opposite surfaces of the brain so closely together, as to render impossible their separation without injury to the substance of the organ.

Some of these statements, which are from Dr West, though not in the arrangement of the author, it is not easy to reconcile with those given by MM. Rilliet and Barthez. According to these authors, tubercle is almost never deposited at the internal (free) surface of the arachnoid membrane; and they add, that they possess only one example establishing the existence of granulations on the internal surface of the arachnoid membrane, in which case they were not numerous. In the case referred to, the inner surface of the *dura mater*, they inform us, below the left parietal protuberance, and nearly at the level of the lateral sinus, presented some small yellow granulations, quite similar to those often observed in an isolated form at the inner surface of the *pleuræ*,—that is, yellow, rounded, lenticular, and tubercular.

According to the same authorities, though the gray, semi-transparent granulations may take place as the only form of meningeal tubercles, yet it is more common to observe a mixture of yellow and gray granulations, some of which being yellowish-gray, establish the fact of the transition from the one species to the other. The isolated yellow granulation is more frequent than all the other forms of tubercle; and to that have been directed those discussions which have been conducted, when the existence of tubercle in granular meningitis has been denied.

In number, these granulations vary much. In some instances, they are so multiplied, that they are closely disseminated in almost all parts of the *pia mater*, and cannot be numbered. In other instances, not more than one or two granules are found in each hemisphere after the most minute search. Between these extremes, the numbers range in every possible degree; and in certain cases the observer counts ten, twenty, thirty, or more granulations.

As to the usual distribution of these bodies, they are met in all parts of the internal convoluted surface of the brain,—namely, on the convex and flat surface of the hemispheres, on the lateral and middle parts of the base of the brain, in the fissures, and on the cerebellum. Among forty-two instances collected by MM. Rilliet and Barthez, these granulations were observed on the convex surface of the right hemisphere in twenty-seven instances;

on the plane or mesial or commutual surface of the same in twelve instances; on the convex surface of the left hemisphere in eighteen instances; on the plane or mesial (commutual) surface of the same in eleven instances; on the cerebellum in two instances; on the right Sylvian fissure in ten cases; on the left in ten cases; on the right surface of the base in eight instances; on the left in eight instances; on the median fissure in two; over the protuberance in one; over the *medulla oblongata* in seven instances.

Miliary tubercles also occur, but not so numerously. In general there are only one, two, or three; and then they have the dimensions of a garden pea or a small nut. When more numerous, namely, varying from fifteen to twenty, they rarely exceed the size of hempseed. These are most commonly seen on the convex surface of the hemispheres.

In this country, according to the observation of the author of these notices, the most usual site for meningeal tubercles is the *pia mater*, covering the cerebellum both above and below; and next to this,—sometimes along with it,—the lower surface of the hemispheres resting on the *tentorium*. In few instances are they seen on the hemispheres above;—at least in cases in which they have been seen over the surface and base of the cerebellum, and on the membrane covering the protuberance; they have not been observed in the upper regions of the hemispheres. Probably, after all, much depends on the region of the *meninges*, in which they are first developed. Thus, it may be the case, that these bodies are developed at an earlier period on the *meninges*, investing the *cerebellum* and its connections, than on those covering the brain; and that, had the life of the patient been prolonged, these bodies might have been found also on the hemispheres.

Dr West does not regard the disease as altogether incurable; but he speaks in not very encouraging language as to treatment. In truth, if what he states be correct,—that not only is tubercle invariably present in the various organs of children who have died of hydrencephalus, but the disease itself in more or less definite symptoms often supervenes,—then it must follow, that all treatment is out of the question and unavailing. The disease, in truth, is not so much a substantive and independent disorder, as the termination and concluding scene of many disorders. Remedies, nevertheless, he recommends; and these are,—depletion, purging, and the administration of mercury. For details, we refer to the work itself.

As to the duration of the disease, the following facts are given. Among 117 cases observed or collected by Dr Hennis Green, 80 terminated within 14 days, and 111 within 20 days.* Among 28 cases recorded by Golis, 18 terminated in 14 days, and only 2 cases were protracted beyond 20 days. MM. Rilliet and Barthez state the average duration of 28 cases which came under their inspection to have been 22 days; and the average duration of 30 fatal cases, of which complete records were kept by Dr West, was 20½ days. Among these 30 cases, the one which pursued the most rapid course terminated fatally in 5 days. In 10 more, death took place before the 14th day; in 11 others, during the third week; and in 3, during the fourth week. In the residual five cases, indication of cerebral disorder had been present for four, six, or eight weeks; and death took place, in every instance, in less than 21 days after the appearance of well-marked symptoms of hydrencephalus. The disease, therefore, it may be said, runs its course in from two to three weeks. The form called water stroke by Dr Golis, Dr West regards as different from true tuberculous hydrencephalus. He afterwards states, that it is to be viewed as a form of simple *enkephalitis*, or cerebral inflammation.

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* There is here some error which it is difficult to correct. Either the number of cases should be 197 or 191; or the number 111 ought to be only 37.

Before quitting this subject, it is proper to state, that in the Treatise of Dr Underwood, it is allowed, that in children destroyed by hydrencephalus, it is mentioned that the peritonæum covering the diaphragm is occasionally occupied by tubercles, and that the mesenteric glands and bronchial glands are often enlarged, with tubercular or caseous depositions in their substance; and that the lungs may also be similarly affected (p. 351). Dr Milman Coley makes a distinction between the simple and ordinary form of *meningitis*, and the tubercular form; and adds that the latter is to be distinguished from the former, by the intense heat felt in the forehead or upper surface of the head, as soon as the inflammation and symptomatic fever have unfolded themselves; by the pain being more constant, and the delirium more decided; and by its being more apt to attack children beyond the age of dentition, than the simple form of the disease (p. 416).

By the same author a judicious therapeutic direction is given. Dr Milman Coley prohibits absolutely, as soon as it is known that the deposition of tubercles has commenced, the use of all preparations of mercury; because, he adds, they infallibly increase the disease, and expose the patient to much suffering by their injurious operation on the mucous membrane of the cheeks, mouth, and gums. No doubt can be entertained that mercurial preparations have been often most recklessly and hurtfully administered, especially in attempting the cure of the tubercular form of *meningitis*.

Inflammation of the cerebral veins and sinuses, indicated by the presence of coagulated blood, lymph, and purulent matter within these vessels, is found in connection with two morbid states; one long-continued purulent otorrhœa, with disease of the temporal bone, mostly the petrous portion; or abscess of the scalp; the other, the presence of purulent affections in remote organs. Tonnelé records one instance in which inflammation of the sinuses coincided with a pleuritic effusion. Dr West records the case of a young girl of eleven or twelve months, in which the left lateral and left occipital sinuses were filled with fibrinous coagula, after an attack of empyema and purulent *peritonitis*. An instance of the lesion, in connection with a gangrenous vomica of the lung, is given in the Pathological Anatomy of Dr Craigie.*

Hypertrophy of the brain is an important lesion, by reason of its similarity to chronic *hydrencephalus*, and its liability to be confounded with that disorder. The head is generally enlarged, and its weight is too great for the strength of the rest of the body and members. In children not able to walk, the head hangs, or is inclined to one side; and in those who walk, it is common for the child to stumble and fall, overborne by the disproportionate weight and size of the head. The child loses appetite, starts in sleep, is wasted, and becomes restless and uneasy; rolling the head with ceaseless motion from one side to the other. The skin of the head is hot, and in a state of constant perspiration. The disease is generally connected with rickets or struma, and is most common in the narrow lanes of a crowded city, and in the unhealthy valleys of mountain districts, where goitre and cretinism are endemial.

The brain is pale and bloodless. The gray matter is little affected; its colour only being paler than natural. The white matter is paler and firmer than in the state of health, a change which is represented on the authority of M. Rokitansky to depend on a positive increase in the intermediate granular matter of the brain, not that of the nervous fibrils.

The remedies indicated are, proper support for the head of the child, by placing beneath it a horse-hair cushion properly fitted; a thin linen covering to the head; removal from a situation where bad air is breathed, to one where the air is pure and free, especially the sea coast; sponging the surface with salt water, or sea water; immersion in the bath of oak bark; and the internal use of chalybeates, especially the wine of iron, or the ferro-citrate of quinine. In rachitic cases, cod-liver oil in small doses is recommended. Nutritious diet must not be neglected. Some interesting observations on this disease by Canstatt we may take another opportunity of giving.

Inflammation of the membranes of the spinal chord (*meningitis spinalis; meningitis vertebralis*) is observed as an epidemic more commonly than as a sporadic affection. In this manner it prevailed between the years 1842 and 1844 in many parts of France; and it prevailed in the same epidemic manner in the workhouses and hospitals of Ireland in 1846, and also in 1848. The arachnoid of the spinal chord is the part most generally affected; though of many cases the membranes of the brain are more or less involved at the same time. Lymph is effused from the surface of the arachnoid membrane, and often between that and the *pia mater;* yet the substance of the chord usually escapes. The disease was sudden and unexpected in its approach, rapid in its course, and usually fatal in termination. Patients died often in the course of 24 hours, and few outlived the fourth day. Pain in the abdomen, general fever, tetanic expression of the face, involuntary retraction of the head, are the usual symptoms; and these commonly terminate in coma and convulsions.

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* Elements of Pathological Anatomy. Second Edition, Edinburgh, 1848, p. 285.

Little can be done in the way of treatment. The author relates one case in a boy of 11 years, evidently slower in progress and more chronic in character, and in which, under the use of mercury administered till it affected the mouth, recovery took place.

Night terrors are the effect of alarming dreams and uneasy sensations, resulting commonly from intestinal disorder. Sometimes there is an illusion or hallucination, or sort of waking dream, in which the child persists in declaring that he sees a furious cat or dog, or some frightful imaginary object, on or near the bed. These symptoms may also be traced to dentition, in which case the gums should be effectually divided. But the most powerful remedy is a full dose of laxative medicine.

Attentive and even superficial observers may sometimes see in the street children and young persons walking lame, and inclined to the one side, one leg being dragged, while the other sustains the whole weight of the body, and performs the whole duty of moving the person; sometimes with an arm hanging powerless by the side. If both leg and arm are affected, the whole side is so too; but the leg may be affected without the arm, and the arm may be affected without the leg. These are cases of palsy taking place in some instances from birth, or congenitally; in others, in infancy; and in others, in early childhood. If the limb thus affected be examined, it is found to be shrunk or withered, as the common people say; powerless, hanging like a dead weight, and only to be moved by means of the arm or leg of the opposite side; and in general the foot and toes are forcibly inflected or bent, and the hand and fingers in like manner inflected, and cannot be extended.

In order to illustrate the nature and origin of this infirmity, Dr West gives a tabular view of the leading circumstances of twenty instances. Of these twenty, two were congenital; and excluding these, in 13 out of 18 cases, the disorder took place between eight months and three years of age, that is, during the period while the process of dentition was most actively advancing. In only two instances did there seem to be any reason for regarding the infirmity as connected with permanent disease of the brain; and in eight among the eighteen cases, no indication of cerebral disturbance occurred either before the appearance of the paralysis, or came on afterwards.

These are, undoubtedly, strong facts; but it were to be wished that they had been more numerous. We have seen and known cases of palsy of the kind now mentioned, take place, as the effect of attacks which would have been regarded as indicating the presence of *hydrencephalus* or *enkephalitis*, cases in which, that is to say, recovery had taken place; as the effect of attacks of obscure and anomalous disorders of the brain and alimentary canal; and as the effect of attacks of chorea. The congenital cases we believe to be, in general, the effect of atrophy of the brain, and probably depend on some lesion or interruption of the growth of that organ taking place within the womb.

The infirmity is not very curable, especially if it continue long.

First among disorders and lesions of the organs of respiration, comes *Atelektasis pulmonum*,[*] or imperfect expansion of the lungs, so denominated by Dr Edward Jörg, who first explained the nature of this lesion in his Inaugural Dissertation published in 1832, and afterwards more fully in a monograph, published at Grimma in 1835.[†] In this disorder, portions of the lung remain after birth in the fœtal state, unpenetrated by air, compact, of a reddish brown colour, in short, evidently not cleared of the carbonaceous matter of the fœtal condition. The portions thus compact and dark-coloured, are depressed below the level of the surrounding lung, giving the surface of the organ an uneven appearance. These portions, when divided, are solid like parenchymatous substance; do not collapse as sound lung does, because they are already collapsed as far as they can be; do not crepitate, because they contain no air; sink in water; and if inspected under a lens, the pale collapsed air tubes are seen intersecting their substance, and scarcely to be distinguished from the small vessels, which are also almost void of blood. The appearances now mentioned were first observed by Dr E. Jörg, in the dead new-born children in the Leipzig Lying-in Institution. Where the child is entirely still-born, the appearances are less characteristic; that is, the lung is altogether of dark colour and compact appearance.

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[*] Ατελης *imperfectus*, εκτασις *extensio.*

[†] Die Fœtus Lunge von Gebornen kinde fur Pathologie, Tuerapie und Gerrichtliche, Arzneiwissenschaft, geschildert von E. Jörg. Grimma, 1835. Analekten ueber Kinderkrankheiten u. s. w. Zweiter Band, S. 1.

This state of lung is mostly found to take place under the following circumstances. After very easy and speedy labours, there are occasionally seen come into the world, children apparently quite strong, yet almost motionless and feeble, though never in a state of asphyxia; with the breathing defective, the chest moving little, and not presenting the proper degree of arching; and with the eyes half opened. Those infants become, on the use of the warm bath, something stronger; but the breathing continues weak and asthmatic. On the other hand, after difficult labours, children frequently come into the world asphyxiated. The first feeble efforts at respiration acquire strength only after a long time; and in some infants thus born, respiration only slowly attains the degree of completeness necessary to the continuance of life. When these respiratory efforts continue without proper results, the progressively returning inspirations want the normal duration and depth; no breathing is heard, and only a feeble and whining sound; the eyes are generally closed, and opened only with difficulty; the limbs appear as if powerless, or are moved slowly and heavily. The child neither sucks vigorously nor swallows well. The temperature of the surface falls; the skin becomes pale, dingy, and bluish in patches, especially at the extremities; twitches are observed to affect the muscles of the face. These symptoms increase and become more frequent, and at length the child expires, either apparently in a state of great feebleness, or exhausted by repeated convulsive movements. This is what may be termed the congenital form of the lesion. Dr West makes also an acquired form, in which portions of lung, after having been traversed by air, cease from various causes to admit that fluid, not, however, in consequence of alteration in structure, but from simple collapse of the pulmonary tissue.

In general, in connection with the unexpanded lung, it is found that the pulmonary vessels contain less blood than usual; that the *foramen ovale* is commonly open, and the *ductus arteriosus* imperfectly closed. The brain also is commonly loaded with dark coloured blood.

The cause of this peculiar lesion is not well known. Dr Jörg supposes that one cause of the uterine contractions is to enfeeble the circulation in the placenta, and thereby cause the child to feel as it were the necessity of inspiring the atmospheric air. But in cases in which labour is easy and rapid, he thinks that the infant is precipitately brought into the world, before this instinctive necessity is felt, and consequently before respiration is fully established. The validity of this explanation, Dr West calls in question; and he thinks that all that can be said is, that when, from any cause, the establishment of respiration has been attended with difficulty, it is probable that it never will be completely established, and that, while the air may enter some of the lobules of the lung, it may fail to penetrate others. *Atelektasis*, or imperfect expansion must be distinguished from congenital phthisis.

The treatment consists in endeavouring to maintain the temperature, by keeping the child warm; the short use, that is for four or five minutes, of the warm bath; afterwards gentle friction with dry cloths, and a very moderate and cautious use of stimuli. We should say that the best stimulus is pure fresh air; with occasional attempts at artificial respiration.

It has been said that there is of this lesion an acquired form. It is a proof either of the difficulty of the subject or of the precipitancy of inquirers in drawing conclusions, that this acquired form of unexpanded lung, or compressed lung rather, has been by many observers regarded as lobular pneumonia. It has since been ascertained by MM. Bailly and Legendre, that the appearances to which this name of lobular pneumonia was applied, are produced by occlusion, or closure of the pulmonary vesicles. This occlusion, may be the result either of closure by the contractility of the lung, or of their parietes being compressed by a congested state of the capillaries, or of both causes combined. It is not a cadaveric appearance, as might by some be alleged. But it appears to be the consequence very commonly, of a sort of passive pneumonia, or bronchitis in a peculiarly feeble state of the system, a state in which the blood moves not easily through the vessels, or is not easily drawn into the bronchial tubes, probably from muscular feebleness, and consequently the small tubes and vesicles are permitted to become collapsed.

One of the most important consequences resulting from the knowledge of *Atelektasis pulmonum* as an individual and primary lesion, is, that it may be regarded as one of the causes of the peculiar form of disease called Induration of the Cellular Tissue in infants. This, though not a frequent affection in the hospitals of this country, is very common in those of France and the Continent n general. Its great fatality is also thus explained. If the induration be general, death almost invariably ensues; and so fatal is the lesion, that, including even slight cases, five-sixths of all the children who are attacked by it in the hospitals of Paris, perish. In slight cases, and if the infant be placed in favourable circumstances, recovery may be anticipated. The most favourable circumstances, it is manifest, are the full establishment of the function of respiration, and the universal expansion of the lungs. The solid, uncrepitating, and unexpanded state of the lungs in infants, with this lesion, has been noticed by several previous observers.

Catarrh, *bronchitis*, and pneumonia, are, all of us know, frequent diseases in infancy and childhood. *Bronchitis* usually assumes the vesicular form, and then is liable to proceed, and often does proceed, to pneumonia, and lobular pneumonia. Indeed there is strong reason to believe, that when pneumonia affects the lobules of the lungs separately, it has been the effect of bronchitis of the vesicles, which spreading to the surrounding tissue, then affects the lobules of which the lung consists. Purulent matter is then formed within the vesicles and around them; while indurated bands or spheres indicate the spaces within which the inflammation is going on, and within which also are usually contained small abscesses not larger than the size of a small pea.

Pneumonia affecting the lobes, or lobar pneumonia, is with children a more common disease than is generally imagined. It is attended, besides the usual appearances, with ecchymotic spots and patches, forming spots of pulmonary apoplexy the size of a millet seed and larger. The disease resembles in all respects that of the adult, except that it is more liable to terminate in abscess. Among 47 cases of lobar pneumonia recorded by Dr West, in three did abscess of the lung take place. Of these, the author gives detailed accounts, illustrating the nature of the lesion. They appear to have been genuine examples of purulent collections.

The lung in childhood shows a greater tendency to be affected by gangrene than in adult age. This gangrene, however, Dr West thinks, is not the result of the mere intensity of the inflammation, so much as of some peculiar change in the blood, which favours the occurrence of mortification. As this lesion takes place mostly in hospitals, and in similar situations in which the atmosphere is not pure and often much contaminated, it is most likely that the occurrence of the lesion is more or less connected with the state of the atmosphere.

Inflammatory disorders of the lungs are more fatal in infancy than in childhood, and in childhood than in adult age. From the fifth report of the Registrar-General, it results, that 72 per cent. of the total mortality from inflammatory disorders of the lungs and *bronchi* in the metropolis took place in persons below fifteen years of age; 68 per cent. in children under five years of age; 61 in children below three years of age; and 31 per cent. in infants under one year. The time of infant life at which these disorders seem to be most prevalent coincides exactly, according to Dr West, with the period of dentition.

In speaking of the means of cure, Dr West cautions the practitioner against the indiscriminate and excessive use of antimony, which is an agent of too powerfully depressing effects for the system of the child, and may induce so great debility, that expectoration is rendered impracticable. He recommends, therefore, that these depressing effects be not carried too far. So far as we have been able to judge, we must say, that antimony should very rarely be given to infants and children in attempting the cure of bronchitis or pneumonia; and it is so much the less necessary, as, in the majority of cases, the wine of ipecacuan is both a more safe remedy and not less effectual. If it be determined, however, in any given case, from the severity of the symptoms, to administer antimony, its effects ought to be most carefully observed and watched, and its exhibition should be stopped, the moment it is seen to produce the peculiar symptoms of antimonial poisoning. After it is withdrawn, if symptoms of oppressed breathing continue, the next best remedy is ipecacuan wine in proper doses. We have also seen great benefit result, in these disorders of children and infants, from the judicious and careful use of digitalis. But the effects of that agent also require to be carefully observed and watched. We observe that in the treatment of these diseases, Dr Davies decidedly prefers ipecacuan to antimony, in consequence of the extremely-depressing effects of the latter upon the systems of children. Dr Coley recommends, after general blood-letting, the use of calomel in small doses, with the view of unloading the congested state of the pulmonary arteries, and preventing the occurrence of impending hepatization. For œdema succeeding to pulmonary inflammation, he recommends the employment of digitalis; and, when expectoration appears, notwithstanding the use of these measures, to be scanty and diminished, the use of sesqui-carbonate of ammonia and squill.

All the three authors recommend the application of blisters,—Dr Davies with the precaution of keeping them on not beyond two hours; and Dr West gives, at p. 205, a caution against their use in the case of solidified lungs. The admonition of the latter gentleman is almost superfluous; for we doubt whether any remedy is of use against solidified lungs. The precaution of Dr Davies is certainly of great importance; but, in certain cases, blisters applied to the skin of the infant are attended and followed by the most serious evils; and often have we seen sloughing of the skin and tedious suppuration, and in some cases death, follow the application of a blister to the chest of an infant. Sinapisms are much safer remedies; and we agree with Dr Marshall Hall in saying, that, in affections of the chest requiring counter-irritation, especially assuming a tendency to the chronic form, we have repeatedly seen beneficial effects result from the use of the liniment of opodeldoc and ammonia. The croton oil liniment is also one of great efficacy, and, if used with proper precaution, causes little or no inconvenience.

In explaining the circumstances on which depends the peculiar symptom of crowing inspiration or spasm of the glottis, Dr West regards the causes usually assigned by authors,—that is, the compression by enlarged bronchial glands, the thymus gland and similar states, as inadequate, and justly maintains that the causes necessary to produce that peculiar modification of the nervous system are various. He then bestows a high panegyric on the theory deduced by Dr Marshall Hall from the phenomena of reflex action, and maintains that this alone furnishes the true explanation. This is excitation of the true spinal or excito-motony system. This excitation originates in

I.—1. The trifacial, in teething.
    2. The pneumogastric, in over or improperly-fed infants.
    3. The spinal nerves, in constipation, intestinal disorder, or catharsis.

These, again, act through the medium of

II.—The spinal marrow; and,

III.—1. The inferior or recurrent laryngeal, the constrictors of the larynx.
    2.—The intercostals and diaphragmatic, the motors of respiration.

The apparent beauty of this hypothesis is undeniable; but it is by no means new. We do not believe that any great number of practical physicians in this country ever adopted,—that is to say, unconditionally,—the hypothesis either of Dr H. Ley, or Dr Kopp and his German brethren. That hypothesis attempted to explain by mechanical means, and to ascribe to mechanical pressure and irritation, phenomena, which are certainly often dynamic and nervous, and depend upon nervous irritation, as the cases which recovered evidently demonstrate; and the cases which did not recover as evidently demonstrated, by showing the existence neither of enlarged bronchial glands nor enlarged thymus gland. By what means, then, it can be asserted, that Dr Marshall Hall has been the sole person to perceive the truth of this principle, it is not easy to discover. An active and unwearied inquirer into the properties of the nervous system he undoubtedly is. But few will be inclined to regard many of his explanations in any other light, than as giving new names to objects and facts which have been long known.

On this disorder, much interesting information is given in the work of Dr Underwood. But it would have added to the perspicuity of the account, if some of the old matter had been entirely removed, and a new and complete article had been written. We observe that in making a reference to the observations of Dr Merriman, no allowance has been made for the difference in pagination. The page of the edition of 1827 is given, whereas in the present edition, the page on which that gentleman's notice appears is 181. The tendency of the remarks of Dr Merriman is to support the hypothesis of Dr Hood, Dr

Kopp, Dr Ley, and similar authorities, in favour of the enlarged state of the bronchial glands. But the effect of these and all similar observations is completely neutralized by the facts of an instructive case observed by Dr Robert Lee, in which the isolated follicles of the ileum were affected, either with enlargement or tubercular infiltration, proceeding, in many instances, to ulceration.

It is several years since similar instances with which we have met, served to satisfy us, that the disorder is very frequently connected with a morbid condition of the intestinal mucous membrane, yet not always an organic and incurable morbid condition. In one case in which the disease terminated fatally, we found from sixteen to eighteen invaginations of the ileum; and opposite each of these invaginations was a patch of the aggregate glands of Peyer, very much enlarged and roughened on the surface. Nothing morbid was seen, either in the larynx, trachea, or the bronchial glands. This infant, we believe, might have recovered, if there had been time to re-establish the healthy state of the intestinal mucous membrane; but, as in other similar cases, the spasms were so violent and sudden in accession, that no time was given for employing proper means of remedy.

The treatment recommended by Dr Davies is that which will suit the majority of cases.

The subject of phthisis in children naturally suggests that of tubercular diseases in general. These disorders, though very frequent in early life, affect certain textures and organs more frequently and more extensively than others, so that at particular ages it may be truly said that tubercular deposits evince a disposition for one set of organs more than another. To illustrate this sort of election or preference indicated by these bodies for particular organs, at different periods of human life, Dr West gives the following table digested from facts collected by three different authorities.

Of 100 instances in which tubercle was deposited in some of the viscera, it was present in

	Children from 1 to 15 years,	Adults from 20 years and upwards,	
	According to Rilliet and Barthez.	According to Louis.	According to Lombard.
In the Lungs,	84	100	100
Bronchial glands,	79	28	9
Mesenteric glands,	46	33	19
Small intestines,	42	33	0
Spleen,	40	13	6
Pleura,	34	2	1
Peritonæum,	27	0	0
Liver,	22	0	1
Large Intestines,	19	10	0

Membranes of brain,	16	0	2
Kidneys,	15	2	1
Brain,	11	0·8	2
Stomach,	6	0	0
Heart and Pericardium,	3	0	0

There is so great discordance between the numbers of the second and third columns, that it may be doubted whether from these results any certain conclusions can be confidently deduced. But the first column leads to the following results. Tubercular deposits, though more frequent in the lungs than in any other organs, are 16 per cent. less frequent than among adults. Next to the lungs, the organs in which tubercular deposits are most frequent are the bronchial glands, in which they are in children nearly three times more frequent than in adults, according to Louis; and according to M. Lombard, nearly nine times more frequent.

Then come the mesenteric glands, in which these deposits are about one-third more frequent in children than in adults. The small intestines and spleen are in this respect not very different. After the pleura, peritonæum, liver, and large intestines, follow the cerebral membranes at an interval progressively decreasing; and after the kidneys follows the brain itself, in which the frequency of tubercles in children is not great. On the liability of other textures to be affected by tubercle it is unnecessary to dwell. It may not appear very distinctly, whether these results be capable of any theoretical or pathological application. In a practical point of view they are almost null; stating merely that tubercle is a most common disease in certain organs, especially the lymphatic glands in early life; and that its liability to being formed diminishes as life advances;—a proposition which has been long familiar to the profession.

On the subject of the comparative frequency of tubercular deposits in different organs, Dr Cless of Stuttgart published in 1843 some instructive facts, which we may afterwards take occasion to place before our readers.

In four respects, according to Dr West, the anatomical characters of tubercles in the lungs differ in the child from those observed in the adult.

The *first* peculiarity consists in the frequency with which gray granulations and crude miliary tubercles are formed in the lung, independent of each other, and of any other forms of tubercular deposit. In the adult, M. Louis ascertained that miliary tubercles were unassociated with gray granulations, in two instances only among 123, or in 1·6 per cent.; and gray granulations with miliary tubercles in five among 123 instances, that is, 4 per cent. MM. Rilliet and Barthez found tubercle without gray granulations in 171 instances among 265 children, or in 64 per cent.; and granulations alone in 36 instances, or in 13 per cent. Observations made by Dr West on 54 instances of children with tubercle in the thoracic viscera led to nearly the same result.

This peculiarity is ascribed by the author principally to the great rapidity with which tubercular deposits are often formed in early life.

The *second* peculiarity is the great frequency with which yellow tubercle is observed in early life. MM. Rilliet and Barthez met with this form of deposit in 88 instances among 265 children, or in 33 per cent. Dr West found it in 16 instances among 55 children,—numbers which stand in the same proportion. This form of tuberculation seldom exists alone, but is almost invariably associated with gray granulations or yellow tubercle, and usually co-exsists with a far advanced state of tuberculation of the bronchial glands. It may be confined to one lobe, usually the upper; and in those cases in which the right lung is the seat of disease, it may affect the middle lobe. It forms solid cheese-like masses, which occupy much of the lung and compress greatly the bronchial tubes. After the lapse of some time, we have seen it give rise to ragged, irregular *vomicæ* and excavations.

The *third* peculiarity of phthisis in the child, when compared with the same disease in the adult, consists in the greater rarity of cavities in the lungs during early life. Among 123 instances which were examined by M. Louis, cavities were present in the majority; and though the numbers are not exactly stated, there is reason to believe that exceptions were few. Among 265 instances of children recorded by MM. Rilliet and Barthez, in 76 only or 28·6 per cent. were cavities found in the lungs; and in 30 per cent. only were they found in 55 instances recorded by Dr West. These cavities sometimes resemble those found in the adult; and this is true chiefly as to children about six years of age, in whom the general characters of phthisis begin to approach more closely those presented by the same disease in adults. In other instances they are not so much caverns as small excavations or *vomicæ* produced by the softening of small tuberculous deposits. Such excavations communicate with the *bronchi* and with each other, and may be numerous, but do not in general occasion so great a destruction of pulmonary tissue as to form anywhere a cavity of considerable size. The cavities produced by softening of yellow tubercular deposit, which may be regarded as a third form of excavation in the lungs of children, are often formed rapidly, and attain a large size. The whole of one lobe may be converted into a sac, almost or quite empty, while its walls are formed chiefly by the pleura, and a thin layer of the fibrous tissue of the lung.

The *fourth* and last peculiarity of phthisis in infancy and childhood consists in the abundant deposit of tubercle in the bronchial glands, and the changes to which that deposit gives rise. When tubercle takes place in the bronchial glands of the adult, which occurs in almost one-fifth of the cases, the deposit is dependent on, and subsequent to that in the lungs. In the child it seems to be independent, often previous, and is generally more extensive and considerable in amount than that in the adult.

In 55 children examined by Dr West, tubercle existed in 54 instances; in 11, in the incipient state; in 25, affecting all the glands; in 12 instances generally diffused and more or less softened; in 2 instances friable and cheesy; and in 4 instances beginning to become cretaceous.

Into these details, however, we must not at present proceed further. We have said enough to give readers a just idea of the different merits of these works; and as we trust that they will peruse them, we can assure them that they will find information which will reward the labour.

Next come Diseases of the Heart, and the large and numerous list of the Diseases of the Alimentary Canal and its appendages. If on any subsequent occasion, space is allowed us to enter on the consideration of these subjects, we shall endeavour to show, that the authors have done their utmost to present ample and correct information on the important subject of the diseases of early life.

Dr Davies and Dr Milman Coley will, we hope, permit us to offer one suggestion with regard to the choice of names of medicines. Calomel, we observe, is repeatedly called chloride of mercury, which we are aware is in accordance with the practice of the London Pharmacopœia. All that we remark is, that chemical names of medicines are not always judicious, when it is remembered, that these names are changed as often as the chemical doctrine of the day is changed. Calomel and *Calomelas* is a good intelligible permanent name, implying nothing but calomel, and therefore eligible. At one period, when the muriatic theory was in ascendent, this was called submuriate of mercury, to the great risk of being confounded with corrosive sublimate, then the muriate, which was not unfrequently done. Afterwards, when the chlorine theory ascended and became predominant, calomel became the protochloride, while corrosive sublimate was the deuto-chloride. Now, upon some more accurate information regarding the proportions of uniting atoms, calomel is fixed in the meantime as the chloride. How long it is to hold this position, it is not easy to say. But, in the meantime, apothecaries and chemists' apprentices are led into the unenviable position of forming an occasional acquaintance with the Coroner, and probably with the Judge of the Central Criminal Court,—all because physicians will not condescend to adhere to one fixed intelligible denomination.

It may be proper to mention, that, since 1843, there has been published at Berlin a journal devoted to the subject of the diseases of children. The first volume contains various instructive essays and memoirs.*

ART. II.—*A Practical Treatise on the Domestic Management and most important Diseases of Advanced Life. With an Appendix, containing a series of Cases illustrative of a New and Successful Mode of treating Lumbago and other forms of Chronic Rheumatism, Sciatica, and other Neuralgic Affections, and certain forms of Paralysis.* By GEORGE E. DAY, M.D., Fellow of the Royal College of Physicians, and Physician to the Western General Dispensary. London, 1849. 8vo, pp. 342.

WHILE the characters of diseases are much modified by the state of the human frame in infancy and childhood, they receive an influence not less real and considerable from the progress of advancing years and the approach and presence of old age. We have seen, that not only do particular forms of disease prevail most frequently in the early period of life, but the diseases which do prevail at that period receive, as it were, a particular impression from states of the vascular and nervous system, which are predominant during the years of infancy and childhood. Again, certain forms of disease prevail more after puberty and during adolescence than previous to this period; and certain textures and organs are then unquestionably more liable to be affected by the morbific element than others, and than at either previous or subsequent periods of life. During the period of manhood, or after the body has attained its complete growth, diseases assume a character not less peculiar to that time, and different in certain features from those which prevail at other periods of life. The morbific element evinces its effects in different textures and organs, and in different and characteristic modes. At length, old age approaches,—in some early, in others at later periods, but to all, though at different times, with inevitable certainty; and in its train come not only maladies of a peculiar character, but all diseases receive from the state of the system, then either approaching or established, a modification which is so characteristic, that it has long attracted, in a general manner, the observation of physicians and the attention of philosophers.

* Journal fur Kinderkrankheiten, herausgegeben von Behrend und Hildebrand. I. Band., 6 Heften. Berlin, 1843.

It was with the elder pathological writers, as Boerhaave, Gaubius, Nietzki, and Caldani, a favourite doctrine, that in the human frame there were implanted seminal principles of disease (*seminia morbi*), which were at all times present in the fluids and solids of the body, and the slow and imperceptible action of which, effected in various organs those changes, which rendered these organs progressively less fit for performing their functions, and at length totally unfit to perform them. It was understood, of course, that the power and influence of these morbific principles were more or less aided and augmented in different individuals, by external morbific agents, and external powers of various kinds; by climate, the weather, and physical agents in general, different forms of food and drink, occupations, the operation of the passions, and all similar causes. To these, however, was assigned only a concurrent and accessory power, not one quite independent; and it was always believed and taught, that the primary causes of disease, whether dynamic or organic, were seated, fixed, and inherent in the frame of the human body itself.

This idea has never been wholly abandoned, either by physicians, by philosophers, or even by the vulgar. It may have assumed a new aspect; it may have been designated by a new denomination; but the object signified has been always more or less present to the imagination. Has this idea a real existence, or rather, it ought to be said, has the thing signified, the internal morbific principle, a real existence? It is perhaps idle to enter at present into the inquiry, which is more a metaphysical and psychological, than a pathological one. Neither, were we inclined, do our limits permit to enter into the discussion of such a subject. We merely observe, that various writers on pathology, since the beginning of the present century, have more or less distinctly reproduced the idea and doctrine of their predecessors. Kurt Sprengel, for instance, Professor at Halle, one of the great authorities on these points, thirty years ago delivers the doctrine in a form sufficiently distinct and intelligible:—"The internal condition or diathesis, or susceptibility we call that disposition of the body about to become diseased, by which it results, that either actual disease takes place, or may probably take place. First, therefore, is the capacity to be affected by disease universal and natural to the whole human race, and which must be taken into consideration, however active external agents may be. Poison, the sword, and fire-arms or artillery, inflict diseases on those who are in apparently perfect health, or, at most, not tending to disease. But the susceptibility to be affected by disease is less entitled to consideration, than that internal condition, which implies a certain individual proclivity to diseases.*

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* Curtii Sprengel Institutiones Medicæ, Pathologiæ Generalis, Volumen Primum, § 24. Diathesis seu interna Conditio, p. 40. Mediolani, 1817, 8vo.

About ten years after the period when these sentences were the second time published to the medical world of Germany, Philip Charles Hartmann, Professor in the University of Vienna, expressed his views of the same subject, in the following manner.

"§ 595.—If the human body were adequate either to repel or to overcome all those agents, which threaten its health, it would give access neither to hurtful force nor to disease. But as this immunity is not enjoyed by beings living on the earth, which possess only limited powers of resistance and subjugation, the result is, that these bodies are able to subject external agents only of a certain degree and kind. The living body, accordingly, when exposed to the influence of external agents, necessarily yielding to this influence, may be made to deviate from the normal condition, and be subjected to disease, in consequence of the efforts which it makes to resist the influence of these agents.

"§ 596. That condition of the human body, by virtue of which its vital properties may be by inimical agents excited to abnormal action, is named the *Disposition to Disease;* and those external agents, which produce this effect, are denominated *hurtful powers.* Further, man posseses a twofold disposition to disease; one *general*, the other *special.* The general disposition to disease is that which affects the whole human race, since it is rooted in the nature of the human frame itself. The special disposition is that which is proper to certain individuals, and derives its origin from particular relations and modes, by which life is regulated in each individual."*

From other sources, especially the Elements of Analytical Pathology, by Bufalini,† similar passages might be easily adduced, tending to show, that pathological speculators and physicians have at all times assumed the existence of some internal morbific principle or condition in the human body. This, however, it is unnecessary further to do. It is sufficient to mention the circumstance, to show that this morbific principle or element, at all times existing, and probably operating more or less steadily, however imperceptibly, constitutes that essence or condition upon which, extending through all the periods of life, external causes and agents act in inducing diseases, and which at different periods of life being acted upon, or itself re-acting in different modes, impresses on the diseases of each period their peculiar characters.

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* Ph. Caroli Hartmann, M. D., et P. P. O. in Scientiarum Universitate Vindobonensi, Theoria Morbi, Seu Pathologia Generalis Prælectionibus Academicis Accommodata, Editio Altera Emendatior. Vindobonæ, 1828.

† Fondamenti di Patologia Analitica di Maurizio Bufalini Cesenate, Med. in Patria, Gia Assistente et Lettore Straordinario alla Cattedra di Clinica Medica, nell' Universita di Bologna, Attuale Prof. O. de Medecina Teorico-Pratica, Nell' Universita di Urbino, &c. Edizione Terza, Tomo i. Pesaro, 1828. Tomo ii., 1830.

It has been seen that, though the list of diseases to which infant and early life is exposed, is very large and serious, yet some diseases there are, which more particularly predominate at that period of existence. Thus, affections of the nervous system predominate most in infancy, and next to these, disorders of the alimentary canal. Bichat has observed that diseases of the thoracic organs, that is, the organs of respiration and circulation, predominate most after puberty, and between that period and the time that marks the termination of manhood; that in old age, disorders of the intestinal tube and assistant chylopoietic viscera, with those of the urinary organs, begin to predominate; and that, as life continues to advance, again various affections of the nervous system begin to make their appearance. This, of course, is merely such a general view as might occur to a man of observation placed in a large hospital, and seeing daily and weekly many persons labouring under different forms of disease.

Any inquiry relating to the diseases of old age, involves, at least, two questions. The *first* is, of any given number of individuals coming into the world at the same time, what proportion shall live, how many or how few shall be permitted, to see and endure what is denominated old age? The *second* is, what are the maladies most likely to affect that period of life, and what is the comparative degree of their influence in shortening its duration?

As to the first question, the documents and facts collected by the Reports of the Registrar-General, as well as the disquisitions on what is called the mean duration of human life, afford the means of throwing upon it some light, and understanding it more accurately than has hitherto been done. Of 1000 persons, male and female, born in this country, at any given time, at the age of eleven years 702 are alive, and at the age of twelve years, 699; showing that in the course of twelve years, 300 of the thousand have been cut off. At the age of thirty-one years, 598 are left, showing that another hundred persons have in the course of nineteen years been added to the three hundred swept away by disease. At about the age of forty-five years and six months, five hundred are left; showing, that in the course of fourteen years and a half longer, one-half of the whole number of persons born have been carried to the tomb. At the end of sixty-six years and about three months, (66¼) the number of survivors is reduced to three hundred (300). At 72½ years, only two hundred (200) are alive. At seventy-nine and a half, only 100 are alive; and at the age of ninety-six years, all the males have departed, and the sole representative of the thousand persons is one decrepit old woman, deaf, generally blind, and enduring with great difficulty the weight of her advanced age and infirmities.

Between fifty-two years of age and sixty, which may be regarded as the beginning of old age, between 451 and 380 persons are left to look forward to the hope of adding from ten to fifteen, or at most twenty years, to their measure of life. At fifty-two and fifty-three, the probable future duration of life is about nineteen years. At sixty, it is fourteen years for both sexes; and as life advances to three-score and ten, and beyond that period, it rapidly descends to nine, eight, six, and five years. It is further to be observed, that all the survivors cannot live these periods. It is only a certain proportion of them, who have, among others, a chance of, at this time of life, adding five, six, or eight years to their previous existence.[*]

For giving an answer to the second question, not many or extensive data are furnished. There are, nevertheless, some means, especially those furnished by the weekly tables of mortality for London, in which the ages below five, between fifteen and sixty, and above sixty, have their respective numbers of deaths by different diseases specified. From a tabular view of these for the years 1845 and 1846, the following results may be deduced.

The mortality by diseases of the nervous system, which is very large below the fourth year, undergoes a great and striking diminution above that age, till the fifth year, when it is slightly increased. It continues, however, very low till the 35th year, when it begins to be increased, and continues increasing till the seventieth year, after which it is greatly diminished.

The mortality by diseases of the organs of respiration, is in the aggregate of the first five years of life, very little, that is, about one-twentieth, below that by diseases of the nervous system. But it is differently distributed during the four first years. It is during the first year not quite one-half of the whole mortality of the first five years; and in the ensuing two years it is quite as much as in the first year. In the fifth year it is greater than either in the third or fourth year. Between five and ten it is greatly reduced; but at fifteen it is again increased. Between the age of fifteen, and onwards to that of sixty years, the mortality from this source is at its greatest height; and this mortality is chiefly caused by pulmonary consumption in the first fifteen years, and by different forms of pneumonia and *bronchitis* during the last thirty years of the period.[*] This class of diseases forms indeed the largest and most copious stream of mortality to the human race; and it is so much more destructive, that it carries off the largest proportion of human beings during the period of adolescence and manhood.

Zymotic diseases, or those the origin of which depends on the presence and operation of a poisonous agent, either in the atmosphere or evolved from the earth, but most usually the former, form the next great destroyers of the human race. These prevail most numerously, and cause the largest amount of mortality, in children below four years. An increase takes place in the fifth year; and after this, a considerable diminution till the twentieth year, when an increase is again observed; after this there is a slight diminution; but, nevertheless, the mortality is considerable. The mortality between the ages of ten and sixty is caused chiefly by typhus fever.

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[*] Sixth Annual Report of the Registrar-General, p. 520.

[†] Under five years, 2,865; above five years, 5,574; between fifteen and sixty years, 4,241. Between sixty and ninety-five, 821. This is for males only.

The diseases most prevalent and most mortal after the age of fifty and fifty-five, are disorders of the nervous system, as apoplexy, palsy, and similar affections of the brain; disorders of the organs of respiration, as bronchitis, and different forms of pneumonia; disorders of the organs of circulation, as the heart and arteries, and occasionally the veins; certain disorders of the secreting glands, as the liver and kidneys; disorders of the digestive organs; and the not very well defined head and title of old age.

What, it may be asked, is death by old age? In the Report of the Metropolitan mortality for 1845, 1,111 males and 1,848 females are represented to have been the prey of this anomalous and undefined agent. In that for 1846, 842 males and 1,399 females are stated to have died from this cause. In the one year, therefore, 2,959 persons, and in the other, only 2,241, died of old age, making a total difference of 718 persons. The difference is great, and not to be accounted for by the natural and regular workings of old age upon the human frame. The difference depends, we are satisfied, upon improvement in diagnosis; upon more care being taken to ascertain the exact causes of death. The reason, why we think so, is to be found in the fact, that there is not a proportionate difference in the total mortality for these two years.

These deaths take place in persons aged, or supposed to be aged, above sixty; and the great majority of deaths take place between the ages of sixty-five and eighty-five.

The truth is, that of these numbers, approaching in the year 1845 to three thousand persons, not probably one hundred really died of old age, strictly speaking. Many of those who are believed and reported to die of old age, die of positive diseases, which doubtless acquire a peculiar character at that period of life. Thus, pneumonia and bronchitis destroy not a few; pneumonia especially in a latent form, and *bronchitis* proceeding to emphysema and different forms of asthma. It has been ascertained repeatedly, that aged persons in public institutions, hospitals, and asylums for the aged, supposed to die of advanced age, have actually been destroyed by pneumonia in a latent form, sometimes advancing slowly, sometimes more rapidly, but always present so as to destroy the structure and functions of the lungs as a breathing organ.

Again, diseases of the heart, sometimes alone, sometimes with disease of the lungs, destroy many of those supposed and stated to die of old age. Ossification and coalescence of the valves, contraction of the apertures, ossification of the coronary arteries, atrophy and flaccidity of the heart, *steatosis* or fatty transformation of the heart, all tend to produce death in the aged, and all have produced death, which by ignorant or indifferent reporters has been ascribed to old age.

About the age of thirty-seven, or previous to that period in some, but in general about and after that period, the arteries begin in many persons to be affected by the waxy, steatomatous or fatty deposit. This is followed by, or accompanied with, the calcareous deposit; and in this manner, and by these newly-secreted substances, the arteries of the whole body, but especially those of the chest, abdomen, and brain, may be so penetrated, transformed, and rendered brittle, that they can no longer perform their functions as transmissile tubes. As these changes proceed, increasing as the individuals advance in life, they give rise, or may under certain circumitances give rise, to various diseases in the brain, in the chest, and in the abdomen. The arteries of the brain thus affected, cause many of the diseases of that organ peculiar to advanced life, as softening, hemorrhage, palsy, and other disorders.

Inflammation, though occurring in the veins at all ages, is liable, after fifty and fifty-five, to attack spontaneously these canals, and thus to prove a cause of death, which, we have no doubt, has often escaped notice. Several cases of inflammation of the iliac and pelvic veins occurring in persons above the age of fifty-five and sixty years, we have seen prove fatal, either of themselves or by their secondary effects on the lungs, in which these lesions tend to cause the deposition of clots of blood within the pulmonary veins. It is not a matter of doubt, that this state, as a cause of death, has often escaped notice, and that deaths in consequence of the cause now mentioned, have not unfrequently been set down to the head of debility, old age, and similar causes.

Diseases of the kidneys, and the urinary organs in general, have also been overlooked; and the persons dying of them have been supposed and represented to have died of old age.

Diseases of the pancreas have also caused death, and in the same manner have been overlooked and ascribed to old age.

On all the questions thus arising, Dr Day has endeavoured in the present volume to furnish correct information, and if not to remove doubts and uncertainties, at least to diminish their number.

The work consists of thirteen chapters.

In the first chapter, which is general and introductory, the author gives a short view of the most important changes taking place in the system in advanced life. The second chapter is devoted to the subject of the means of preserving the health in declining life. The third chapter consists of general observations on the medical treatment of advanced life; the fourth is devoted to climacteric disease; and the fifth, to senile marasmus and wasting.

In the sixth chapter, Dr Day takes a general view of the diseases most fatal to persons in advanced life. In the seventh he considers the diseases affecting the organs of respiration; in the eighth, those affecting the nervous system; in the ninth, those of the alimentary canal and its appendages; in the tenth, diseases of the heart; in the eleventh, diseases affecting the urinary and generative functions; in the twelfth, diseases of the skin, ulcers on the legs, and senile gangrene; and in the thirteenth, the subjects of gout and rheumatism in their most usual forms.

The years of declining life are, according to Dr Day, naturally divisible into the following epochs:—

1*st*, Declining age, extending in females to about the fifty-second year, and in males to about the sixtieth year.

2*d*, Advanced age or incipient old age, extending in females from fifty-three to about sixty-five, and in males from sixty to seventy.

3*d*, Mature or ripe old age, dating from the periods already specified, and extending to about seventy-five in females, and eighty in males.

4*th*, Decrepitude, or second infancy, constituting in those whose measure of existence is so far prolonged, the last epoch of human life.

During the first of these periods, the feelings, disappointments, and anxieties of life exhibit their effects on the internal organs, as well as on the external appearance, in a more distinct manner and more forcibly than in earlier life. In consequence of the circulation becoming more languid, venous congestions and visceral obstructions, with the various diseases thence arising, become frequent. Piles, apoplexy and palsy, diseases of the liver, kidneys, and bladder, structural changes in the heart, dropsy, chronic disorders of the organs of respiration, gout and mental derangement, are not unfrequently developed about this period. These affections are common to both sexes. About the same time, however, in females, various changes are liable to take place either in the sexual organs, or in the system at large in connection with changes in the sexual organs. Disorders of the uterus, ovaries, and breasts are liable to ensue at, or about this time.

During the second period and the beginning of the third, these changes are liable to increase in force, if not in number. At the close of the third period, the decision of the teeth causes great changes in the organs of assimilation. The osteo-steatomatous transformation of the arteries disposes to apoplexy and palsy, cerebral softening, and mortification of the extremities; and the state of the kidneys and bladder, as well as the tendency to morbid changes in the urine, contribute greatly to impair general health and strength.

In the last period, general decay of the system is manifest from a concurrence of causes. Obscure and latent inflammatory attacks may terminate life.

Among changes taking place in advanced life, affecting both the vital and mechanical properties of textures, next to those already noticed in the arteries, are the ossification of various cartilaginous structures; for instance, the thyroid and cricoid cartilages, affecting the voice and respiration; and the cartilages of the ribs, by which thoracic respiration is greatly impaired and limited, and that function is merely performed by the diaphragm and abdominal muscles. Fragility of the bones is another change of great moment and influence in advanced life.

Physiologists have usually considered it as an established fact, that the frequency of the action of the heart is diminished as life advances. This Dr Day represents to be not the case. Among 562 healthy females, whose mean age is 73 years, he finds that the average number of pulsations is a fraction above 79 in the minute; and among 197 healthy men of the mean age of 68, the beats are 72·5.

It is not our intention to enter on the often-repeated subject of the diet and general management requisite for those advanced in life. We believe that the proper course, what to avoid and what to choose, is well known, whether it be followed or not. In the present state of the question, it is a matter more for the moralist than the physician. Every elderly lady and elderly gentleman knows quite well how she or he ought to live; and if they do not live in that manner, it is because they will not. Self-denial is a thing, which is little known, or if known, it is not practised except in workhouses. If any one, nevertheless, wishes information, this chapter is recommended to especial attention.

About wine, tea, coffee, and other liquors, physicians always become eloquent, and sometimes speak not a little nonsense. Dr Day cautions against excess; and thinks that, to those who have not indulged in the use of wine, it may be well to say, "Drink no longer water; but use a little wine for thy stomach's sake, and thine often infirmities." The wisdom of advising this as a dietetic or an oinochreatic direction may be greatly doubted. It seems almost as if it were one of those texts by which the comfortable dean, with reddish nose, and a decanter of tawny port before him, in the snug old-fashioned parlour of the deanery, encouraged himself to take his daily dose of two ample pints. Surely it must occur to any educated man reading the Epistles, that they were written for more elevated and nobler purposes than instructing men whether they should drink wine, or refrain from that generous but somewhat fiery liquor; and that St Paul, though an excellent apostle and theologian, might have made but an indifferent physician. The evil is, that it is exceedingly difficult to keep men, or even ladies, within the strict letter of the law as to the use of wine; and, where it is permitted to take a little, every one thinks that the little that he or she takes, is really adhering to the precept. So often, however, have we seen and known this text quoted, and made to justify what it never was intended to do, that a more dangerous one we think hardly exists; and we must say, that it is safest to confine the precepts in the Epistles, so far as they are intelligible, to their legitimate and proper uses.

In the whole of these directions regarding the use of wine for the aged and the invalid, there is some danger and not a little folly. One physician recommends for the aged invalid Madeira, another Amontillado, and a third Madre di Xeres; while a fourth tells his patients that port or tent, or some other vinous compound, is the grand remedy for his decaying tabernacle. What advantage have several of these forms of vinous liquor, except that they are expensive, and consequently unattainable by the humble invalid? It appears to us, that all are only different forms of poisonous articles, the use of which has been rendered necessary by the preposterous and pernicious habits of society. A man begins to take wine in early life; and, as he continues it as long as he can, without receiving any intimation of its bad effects, he is then given to understand, that he has done himself and his health irreparable injury, but that if he stops, he is sure to be made much worse, and probably to die. Would it not be much better, for all persons to be taught, in early life, that wine is an indulgence both unnecessary and hurtful, and as the time must come, when its use must be given up, it is best and safest not to begin it at all? Why should any habit, which is admitted on all hands to be bad, be either commenced, encouraged, or carried on?

But why is the wine necessary? Oh, says some sagacious person, it enables a man to digest his food, and is a pleasant tonic. If either of these statements were facts, then it might be reasonable to say, that the moderate use of wine is beneficial. In a large proportion of cases, however, these statements are not facts. Whenever wine is believed or felt to be necessary after taking food, it may be safely asserted, that food too much in quantity and improper in quality has been taken; and the same is still more decidedly true regarding spirits. First, after taking as much food, and eating as great a variety of articles as might serve for two, if not for three meals, wine or diluted spirits, and sometimes undiluted spirits, are taken, in order to enable the stomach, it is said, to perform its duty; in other words, to obscure, stifle, and extinguish all those uneasy sensations which it is made to feel from being taxed far beyond its powers; to render the individual insensible to those salutary warnings, which, in the natural state, are intended to inform him, that he has committed several serious errors in diet. Then, after two or three hours more, when other uneasy feelings begin to arise, he endeavours to allay and stifle them by the use of strong astringent liquors; and lastly, perhaps after committing another error in diet, he has recourse to some brandy and water, and then retires to a disturbed and restless sleep, with a stomach loaded to distension with food little or not at all digested.

Such a course of constant offence to a delicate, membranous, vascular, and nervous organ, cannot proceed long without causing serious injury both to its functions and its structure, and through that to other organs and the system at large. And then the poor victim of all this self-delusion is told that he must not give up his evil courses; for the end of that man would be worse than the beginning. If this really be the fact, patients should be warned in time, while they have not yet proceeded irrecoverable lengths in this career of gastronomic stimulation,—that it is easier and safer not to begin, than, after having begun, to check this course. On the other hand, we must say this, that we have not witnessed, from a gradual and judiciously-managed stoppage of the rations in the persons now referred to, those dreaded effects on which physicians love to expatiate. The subject is, after all, an unprofitable one, for nobody listens to lectures on temperance and abstinence; and if any one does, he forms resolutions which are made only to be broken.

The observations on the uses of medicine in the management of the general health and diseases of the aged, are judicious, and show that the author has carefully considered this delicate subject.

We have always been skeptical as to the existence of climacteric disease, and doubtful whether the true causes of the several forms of this state have been justly assigned. At the same time, as we have more than once considered this subject, and as we press not our views on others, we have only to say, that Dr Day gives, after Sir Henry Halford, an interesting description of the causes and phenomena of this condition of the system.

On the diseases most fatal to persons advanced in life, Dr Day communicates several useful pieces of information. During the five years between 1843 and 1847 inclusive, he finds that the total number of deaths among persons aged sixty years and upwards, occurring in the metropolis, amounts to 58,048. Of these, 15,136, or about two-sevenths, are recorded as having died from the effects of old age. Dr Day agrees with most physicians in thinking that if this class of deaths were ascertained by inspection, the number would be very much diminished. Taking the numbers of both, however, as they stand, 47,902 instances of death by actual disease are left. These are distributed in the following manner:—

Death is ascribed to disease of the respiratory organs in 12,598 instances; to diseases of the nervous system in 6947 instances; to diseases of the digestive organs in 3141 instances; and to diseases of the circulating system in 2841 cases.

Besides these, there are recorded 1076 cases of diarrhœa, 748 of influenza, mostly during the close of 1847, and 417 of erysipelas.

The following table shows the comparative frequency of the causes of death at and after the age of 60 years. Among 1000 persons who have attained that age, there die of old age 285·3

Diseases of the Organs of Respiration.	Bronchitis	79·3	237·3
	Asthma	62·4	
	Consumption	35·7	
	Pneumonia	27·1	
	Hydrothorax	10·4	
	Other diseases	22·6	
Diseases of the Nervous System.	Apoplexy	53·0	130·9
	Palsy	51·2	
	Other diseases	26·7	
Diseases of the Digestive Organs			59·2
Diseases of the Circulating System.	Diseases of the Heart	51·3	53·5
	Pericarditis	1·3	
	Aneurism	0·9	
Diarrhœa			20·3
Influenza			14·2
Erysipelas			7·8
			808·7
Other diseases			191·3
			1000

The residual 191·3 marked as other diseases, consist in a great measure of typhus and dropsy. These the author does not include in the table, because typhus is made to include all cases of continued fever, and because dropsy is a symptom, and may arise from different primary diseases.

It may be further observed, that the rather large head of asthma—62·4 in 1000,—is usually little entitled to be, in all instances, regarded as a primary and independent disease, and in all probability includes various diseases of the lung, as chronic bronchitis, emphysema, and several diseases of the heart, valvular disease, and various forms of dilatation. Hydrothorax, in like manner, which figures at the rate of about one per cent., is very probably symptomatic either of disease of the heart or disease of the lungs. Of the class, other diseases, under those of the respiratory organs and of the nervous system, it is not easy to know what to make. Most assuredly they owe their large proportion and present position to imperfect and careless diagnosis, and probably to the ignorance and indifference of several of the reporters.

Pneumonia, in different forms, is, as has been already stated, the most frequently fatal disease of the aged. This indeed does not appear from the London tables of mortality, in which *bronchitis* is the most frequently fatal disease among those of the organs of respiration affecting the aged. But the fact is abundantly established by the researches of physicians in hospitals in other countries. In the inspection of the bodies of 390 persons at the Bicetre in Paris, the ages of whom ranged between 60 and 90 years, M. Prus found that death was the effect of disease of the respiratory organs in 149 cases; and that these were distributed in the following manner:—

Pneumonia, 77, of whom 6 terminated in abscess of the lung.

Pleurisy,	26
Tubercular consumption,	18
Asthma,	10
Bronchitis,	8
Pulmonary congestion,	4
Asphyxia from meteorism dependent on indigestion,	3

The remaining four were, isolated cases of comparatively rare disease.

Thus, among the entire number of 390 bodies inspected, it appears that in 149 instances, or nearly five-thirteenths, death was caused by disease in the organs of respiration; that among the instances of disease of the respiratory organs, more than one-half were cases of pneumonia; and among the entire number of bodies examined, one-fifth were examples of pneumonia. Dr Day therefore draws a conclusion, which to us has been long familiar, namely, that pneumonia in some form is the most usual cause of death to the aged among the diseases affecting the organs of respiration, and that very probably it is the most frequent cause of death among all diseases at an advanced period of life.

Its most common causes are chronic bronchorrhœa or previously-existing chronic catarrh, the cold season of the year, especially cold frosty nights, and, in certain circumstances, long confinement to the recumbent position in bed. The latter, nevertheless, is rather a cause of hypostatic congestion than of genuine pneumonia. Pneumonia occurs also in the gouty and rheumatic, and those who live rather freely. This was the disease which proved fatal to old Parr; and in his case, it was induced by transition from a coarse spare mode of living, to one in which he lived well, and drank strong wines and other fermented liquors.

Dr Day is rather averse to general blood-letting in the treatment of this malady in the aged, and thinks that local depletions are more eligible and more safe. Antimonials, diaphoretics, and counter-irritants form the principal remedial means.

Bronchitis is liable to terminate in *bronchorrhœa*, which is very common in certain individuals, especially of gouty and rheumatic diathesis. It consists in a profuse secretion of mucous matter from the bronchial membrane, which, at first inflamed, becomes afterwards relaxed. The disease must then be regarded as one of inordinate secretion and debility.

The best remedies are, first, ipecacuanha in emetic doses, then in nauseating doses; then the inhalation of some of the gum-resin vapours; vapour and sulphur baths; dry cupping; gentle laxatives; meadow-saffron in the gouty; and a combination of one grain of blue pill, one-eighth of a grain of tartar emetic, and two or three grains of extract of conium, three times daily, then twice daily, and finally, once daily.

Bronchorrhœa is one of the maladies which give rise to the peculiar symptom called asthma.

Of asthma, Dr Day describes the urinous and gouty forms. These are closely allied. In the urinous asthma, the symptoms are produced chiefly by the presence either of urea, or rather of urate of ammonia in the blood, and causing morbid states in various textures and organs, and morbid phenomena in almost all the functions. The gouty asthma is merely one of the forms of misplaced gout.

Stramonium is spoken of as a useful remedy; and medicated cigarettes compounded according to the formula in the subjoined note,* are represented to be much and beneficially used on the Continent.

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* Picked leaves of Belladonna . .	6 grains.
Hyoscyamus, (leaves, we suppose), . .	3 grains.
Stramonium, ...	3 grains.]
Phellandrium aquaticum, . .	1 grain.
Watery extract of opium, . .	¼ of a grain.
Cherry laurel water, . . .	sufficiency.

The leaves, previously stripped of nerves, to be chopped and mixed; the opium to be dissolved in the cherry laurel water, and the whule to be mixed.

Attention to diet, regulation of the bowels and the non-naturals, in general, are the great points of cure.

All that we require to notice as to influenza is, that Schönbein, the discoverer of gun-cotton, thinks that epidemic influenza depends on the presence of *ozone*, an imponderable agent, in the atmosphere. This product is supposed to be the result of atmospheric electricity; but nothing is hitherto ascertained regarding its properties, except that it may be prepared in the laboratory of the chemist, that it is an intensely oxidizing agent, and that its presence may be demonstrated by chemical tests.

From the Tables for the mortality of the metropolis, it results, that during the five years extending from the beginning of 1843 to the close of 1847, 6,947 deaths, in persons at and above the age of sixty, arose from diseases of the nervous system; and that of these, 2,812 are ascribed to apoplexy, and 2,806 to palsy, leaving 1,329 cases to cerebral softening, tumours, and diseases of the membranes. Dr Day expresses himself severely against the classification; assigning as the reason;—that the statement that palsy caused death to 2,806 persons conveys no correct information whatever. It may be presumed, that of this number, several, or even many deaths, were caused by cerebral softening. In many instances also, death seemingly produced by affections of the brain, depends, in truth, upon disease of the liver, of the kidneys, or of the arteries. Some more careful distinction ought to be made to render these tables of any utility, either pathological or practical.

Of the next subjects, meningeal apoplexy, cerebral softening, *meningitis*, and the different forms of mental derangement, we have so often spoken in detail in recent volumes, that it is unnecessary to do more than mention the names.

The frequency of diseases of the alimentary canal may be understood from the numerical proportion in the table already given. The comparative frequency of each disorder, and of disorders of different divisions of the tube and its appendages, there are no means of exactly ascertaining. The only accurate facts are obtained from the report or memoir by Prus, already referred to, in which it results, that among 390 persons dead above 60 years from various diseases, in only 49 cases was death caused by diseases of the alimentary canal and its peritoneal covering, and in 8 instances from disease of the liver and gall bladder. In these 57 cases, death was caused in 27 instances by *enteritis;* in 10, by cancer of the stomach; in 4, by gastro-enteritis; in 3, by dysentery; in 3, by hepatitis; and, in 10, by miscellaneous disorders.

Dyspepsia, in different forms and with different symptoms, is a common but not a fatal affection in advanced life. It may, however, produce other disorders, as urinary and renal affections, gout and rheumatism; and it may, during periods of epidemic influence, pave the way for diarrhœa and dysentery and cholera. Thus, in the summer of 1846, many aged persons habitually dyspeptic were cut off by diarrhœa. During the prevalence of the cholera epidemic, which is not yet completed, many persons above fifty, habitually dyspeptic, were also attacked and destroyed. And, lastly, it is not unusual for persons who have had dysentery abroad, and in miasmatic situations, to be attacked and destroyed by this disease after the age of sixty years.

The present author thinks that the most frequent forms of the disorder in the aged are acute atonic dyspepsia, and that described by Dr Tweedie J. Todd as follicular gastric dyspepsia. In the latter case, the muciparous follicles are in a state of chronic irritation and congestion.

Diseases of the rectum are not uncommon at an advanced period of life. Such are hemorrhoids; inflammation of the rectum (*proctitis*); contraction of the rectum; follicular disease; cancer of the rectum or of the colon, mostly tubercular; and occasionally abscess around the bowel.

The affections of the heart may take place at any period of life; yet a certain order of them is greatly more common at advanced periods than previously. All the affections which depend on, or are connected with, steatomatous and osseous deposit, are peculiarly the appanage of advanced life. *Angina pectoris* is very seldom met with before the age of 50 years. After that it is a frequent cause of death. Valvular disease, in like manner, is more common after 60 years than previous to that age. But it is a common observation, confirmed by all experience, that the symptoms produced at that period of life, are rarely so well marked as when lesions of this kind appear at earlier periods; and hence aged persons more frequently are cut off suddenly and unexpectedly than younger individuals labouring under these disorders.

The several orifices of the heart become enlarged as life advances, but at different rates. Hasse ascertained, that while the progressive enlargement of the two auriculo-ventricular orifices is tolerably uniform, the orifices of the aorta and pulmonary artery increase equally till the meridian of life; and that the aortic orifice enlarges more rapidly in advanced life than that of the pulmonary artery, so that, in aged persons, the pulmonary orifice is narrower than the aortic. This comparative contraction of the pulmonary artery, in relation to the aorta, is one among other causes of the venous plethora or congested state of the veins, which is almost constantly observed in advanced life. The valves, also, become inadequate, generally in consequence of chronic inflammation rendering them rigid, and shortening or contracting their texture.

On the subject of diseased states of the urine and the urinary organs, on affections of the skin, and on gout and rheumatism, it is unnecessary to enter, as these subjects have been frequently and fully considered in treating of various other works.

It is only necessary to say, that Dr Day has produced a work containing much instructive information on the diseases of aged persons and the methods of treatment, medical and domestic, most suited to the removal and alleviation of these diseases. He has been at considerable pains in collecting from various sources whatever facts might elucidate either the pathology, the etiology, or the treatment of these diseases. The volume cannot fail to be read with advantage; and we shall not further anticipate the interest of the reader.

ART. III.—*Elements of Anatomy.* By JONES QUAIN, M.D. Fifth Edition. Edited by Richard Quain, F.R.S., and William Sharpey, M.D., F.R.S., Professors of Anatomy and Physiology in University College, London. In two vols., Part iii., forming the conclusion of volume second. London, 1848. 8vo, Pp. 879—1363.

THIS third part concludes the new edition of the work of Dr Jones Quain. It is only necessary to say, that the work now, when entirely before the public, fully realizes the opinion which was given in this Journal on the first two portions. It may be said to be, in a great degree, a new work. This character is particularly applicable to the Treatise on General Anatomy, which occupies in the present edition three hundred and seven pages. It is manifest that the author, Dr Sharpey, has with this part taken very great pains; and that, from personal observation and that of the most skilful microscopical observers, he has presented a very correct and faithful view of the present state of knowledge in the minute anatomy of the different tissues.

The Descriptive Anatomy in the present portion is accomplished with not less ability. It embraces the anatomy of part of the nervous system, the anatomy of the eye, the ear, the alimentary canal, the organs of respiration, the urinary organs, and the reproductive organs, with an account of the anatomy of the parts concerned in hernia and in lithotomy.

We have no hesitation in recommending this treatise on anatomy as the most complete on that subject in the English language; and the only one, perhaps, in any language, which brings the state of knowledge forward to the most recent discoveries.

ART. IV.—1. *School Chemistry; or Practical Rudiments of the Science.* By ROBERT DUNDAS THOMSON, M.D., M.C., University of Glasgow; Lecturer on Chemistry in the same University, &c. London, 1848. 12mo, pp. 232.

2. *An Introduction to Practical Chemistry, including Analysis.* By JOHN E. BOWMAN, Demonstrator of Chemistry in King's College, London. London, 1848. 12mo, pp. 280.

3. *Chemistry, as exemplifying the Wisdom and Beneficence of God.* By GEORGE FOWNES, F.R.S., Professor of Practical Chemistry in University College, London. Second Edition. London, 1849. 12mo, pp. 160. The Actonian Prize Essay.

THE importance of making a certain amount of chemical knowledge a part of the general education of young persons, has been now long recognized. Nor has the application of this principle been confined to the education of those ranks in society, who obtain their instruction in specific courses, from express teachers in universities and other public establishments. In the School of Arts in this city, and in similar establishments in others, lectures on chemistry, suited to the capacities, previous attainments, and habits of the pupils, have been long delivered, and have been of much use in diffusing the knowledge of chemistry and chemical processes among classes of society to whom formerly this species of knowledge was not accessible. In academies, also, and boarding schools, means have been adopted for initiating the pupils in the elements of this useful science; and there is no doubt that, while all these measures have tended, however imperfectly, to gratify among one set of young persons rational curiosity, it has created among others a taste for further acquisitions, and induced many to study the science with industry and attention.

Various attempts have been made by chemical writers to assist in this forward movement, by the compilation of treatises, expressly intended to initiate the young in the most necessary elements of chemical knowledge. It would be silly exaggeration to say that all these attempts have succeeded; and it would be far from a just representation to assert that they have altogether failed. Nothing is so difficult as to give scientific propositions and doctrines a popular appearance; nothing requires so much ingenuity and talent, as to render all the mysteries and complications of science quite intelligible to those who are either imperfectly educated, or have not, by previous habits of thought and application, been familiarized to the subject. The last, indeed, is one of so great difficulty, that many respectable persons believe all attempts of this kind to be absurd, and regard all endeavours to popularize science as worse than useless.

The only mode of procedure in this dilemma is to try. By endeavour, aided by labour and perseverance, all practicable things are done; and nothing can be justly asserted to be impracticable, until, after all trials, such has been found to be the result.

The small treatise by Dr Thomson, is one in which we think that the author has shown much skill in adapting it to the purpose of popular instruction. The histories of the different substances and agents, and the modes of preparing them, are delivered in short, clear, and intelligible language. Every opportunity is taken of rendering them interesting, by stating practical applications, and, above all, applications in various arts. Every species of knowledge is rendered available by short appropriate explanations of substances, unknown or imperfectly known by pupils.

The sixth and seventh chapters on organic chemistry, contain what may be denominated the chemical history of the vegetable and animal world. Both are done with perfect knowledge of the subject. In both, the information is interesting; and we recommend, in the strongest manner, the work of Dr Thomson to the notice of chemical teachers, and instructors of youth in general.

The Practical Treatise of Mr John E. Bowman may, at the same time, be mentioned as one which has for its object the rendering easy the business of chemical manipulation, chemical demonstration and experiment, and chemical analysis.

The author, it will be remembered, is demonstrator of chemistry, or public teacher of experiments in King's College; and the work is intended as a guide to his pupils in studying that branch of knowledge. It is unnecessary to enter into formal detail of the contents of the Treatise. It is sufficient to say, that the author explains with clearness and ability the various processes employed by the practical chemist in conducting chemical experiments, the rules to be observed in managing chemical manufactories, and the details of chemical analysis in general. The subject of tests and re-agents is very fully treated. Altogether, the Treatise of Mr John Bowman forms an excellent practical guide, and as such, may be recommended to the student of chemistry.

The third work on the list is a republication of the interesting Treatise by Mr Fownes. It consists, as formerly stated, in volume sixty-seventh,* of a series of arguments and reasonings deduced from chemical processes, and the chemistry of the natural world, to illustrate the wisdom, benevolence, and contrivance of the Supreme Being. Of the merits of the treatise in this respect we formerly expressed an opinion, which we have only at present to repeat. The author ingeniously introduces much varied and instructive information; and his work, though small, is one of high interest.

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* Edin. Med. and Physical Journal, vol. lxvii., p. 301. Edin., 1847.

ART. V.—*Observations upon Bulam, Vomito-Negro, or Yellow Fever, with a Review of a Report upon the Diseases of the African Coast, by Sir William Burnett and Dr Bryson, proving its highly contagious powers.* By Sir WILLIAM PYM, K.C.H., Inspector-General of Army Hospitals, and Superintendent-General of Quarantine. London, 1848. Post 8vo. pp. 331.

IT is quite unnecessary to say, that we regret to see the present work published by Sir William Pym; for it is certain, that the author himself, instead of publishing it reluctantly, or with any feeling of sorrow, really regards it as a sort of triumph, on the one hand, to proclaim his opinions, and a duty, on the other, to impress upon the medical officers of the navy, and probably those of the army also, the opinions which he entertains. Certain we are, however, that the appearance of this performance will add nothing to the well-established reputation of the author. All the opinions of Sir William Pym upon the subject of yellow fever have been stereotyped for the last thirty-five years. He has made in them no change, no modification, no rectification. He stands very much in the position of a solitary monument, the great type of contagion, when all his contemporaries, supporters, and abettors have been swept away, amidst the flux and reflux of the great tide of public opinion.

It would be very unprofitable, if not flat and stale, were we to attempt even to reproduce in these pages all the old opinions upon contagion, which first gave celebrity to the name of Sir William Pym. The old story, one hundred times refuted, of Bulam Fever, the importation of Bulam Fever, as if it were an article of export and import, to the West India Islands, to Great Britain perchance, certainly to Spain, France, and many other countries; the highly contagious nature of Yellow Fever, and the great peculiarities of infection and contagion;—these are the leading topics of the present volume. To throw a new light upon these subjects, treated in the manner in which they are discussed by the author, would exceed the powers of inspiration itself. Our readers will have the goodness to consult, for all requisite information, the article on the report of Dr Bryson in volume sixty-ninth of this Journal.* It is unnecessary to refer to the multiplied articles that have appeared in its pages during the last thirty years on the same subject.

Neither is the volume altogether void of interest. To all who wish to see how much can be said in favour of the contagion of Yellow Fever, and the Bulam origin of Yellow Fever, it may be justly recommended as a work of considerable information. The following sketch contains perhaps the essence of the doctrines of Sir William Pym on this debated subject:—

> "Sir William Burnett, above thirty years ago, published a volume upon Mediterranean Fever, the Bilious Remittent of the islands of Malta and Minorca, and, from the skin of many of the patients becoming yellow, he took it for granted that it was the same disease as the Yellow, or Vomito-Negro Fever, at times so fatal on the African coast and in the West Indies.
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> "This fever, the subject of Sir William Burnett's publication, is endemic at a certain season of the year in different parts of Europe, in the neighbourhood of marshes and moist uncultivated grounds; and in tropical climates it prevails in such localities at all seasons, known as the marsh, or remittent fever of the West Indies, the malaria fever of the Levant, and the jungle fever of the East Indies; it is, in fact, a higher grade of the well-known Walcheren.
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> "This fever is not contagious. It is a fever of considerable duration, extending from three to thirteen or fifteen days, and has distinct remissions and exacerbations. Any person who has suffered one attack is liable to relapses and repeated attacks of it; and it very often terminates in ague, followed by derangement of the liver and other viscera. *Blood-letting* is a favourite remedy in this fever, and its use is attended with success.
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> "The Bulam, or Vomito-Negro Fever, which Sir William Burnett fancied he was writing upon, is a very different disease. It is in no way connected with malaria, marshy, or unhealthy situations. It is a native of Western Africa (as the *pestis bubonica* is of Egypt and Syria), and has not been known to prevail, even in that country, excepting at distant and uncertain periods, p. 73.
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> "It is highly infectious, and, consequently, capable of being communicated by the crew of a ship under its influence to a population on shore, or to the crew of another ship, more particularly in warm latitudes, or in countries enjoying a certain degree of summer heat, its infectious powers being increased by heat, and *totally destroyed by cold.* Patients, after an attack of this fever, *never* suffer from ague, or affections of the liver, as they do after an attack of the remittent fever (they may, no doubt, in marshy situations, but not as a sequel to this disease). It is a disease of comparatively short duration, terminating, in fatal cases, from the third to the fifth or

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* Edinburgh Medical and Surgical Journal, Vol. lxix. p. 107. Edinburgh, 1848.

sixth day, with hiccough, non-secretion of urine, and black vomit: this last symptom rarely or never appearing in the remittent fever. It has also the singular and peculiar character, now universally acknowledged, viz.—that, like small-pox, it *attacks the human frame but once.* I may add, that this vomito-negro contagious fever is unknown in the East Indies, in Egypt, or in Syria; although, in the regular season, the remittent fever is sufficiently prevalent in those countries.

"Blood-letting, so successful in the cure of the remittent fever, is in this last disease inadmissible.

"Sir William Burnett, in writing upon his Mediterranean Fever, takes up his pen, and coolly informs the public of his intention to remove the obscurity in which the fever of Gibraltar had hitherto been enveloped. The *attempt*, he acknowledges, had been attended with *many insurmountable difficulties*, which must have been expected, when taking into consideration, that he had not seen the disease. The fact is, he has confounded three different fevers, mentioned at p. 3, viz.—the Bulam, the Remittent, and Bilious Continued Fevers."—Pp. 94–6.

Had all the statements and views of Sir William Pym been expressed in this manner, there would have been little ground for objection or disapprobation. It is competent for every one to state his own views and opinions, and to give his own explanations of facts, provided this be done in a temperate manner, and without impugning the motives or assailing the characters of those, who differ in matters of mere opinion, and in the inferences to be deduced from facts.

In the following extract, however, the author appears in a new character:—

"The objects of the Lords of the Admiralty in calling upon Sir W. Burnett and Dr Bryson for their Report, was no doubt with the view of obtaining for their medical officers employed on the coast of Africa information as to the nature and origin of the diseases on that station, and as to the precautionary measures to be taken for the purpose of averting or diminishing fever. They ought, therefore, in their very short history of the fever in the *Bann*, to have been most particular in giving a true and faithful account of all occurrences relative to the date of its commencement and origin. They have, however, signally failed in this duty. So far from having given a faithful and impartial history of the disease from its commencement, they have altered dates, suppressed facts, and made most unfounded assertions relative to the origin and cause of fever at Sierra Leone, and on board the *Bann* in the years 1822–3; and, so far from giving information and advice to young naval surgeons, they lead them astray, and keep them in ignorance of the real nature of the fever; so much so, that every naval surgeon who has served on the coast of Africa, is under the impression that he has seen and treated the yellow fever; although it is clear, from the evidence of Mr Ferguson, confirmed by Dr Aitken, the one having been sixteen and the other eighteen years resident at Sierra Leone, that the black-vomit fever had not appeared there between the years 1823 and 1829, nor between this last year and 1837."—P. 92.

It is with no pleasant feelings that we place this passage in the pages of this Journal. It contains language which ought not to be spoken by one member of the profession of another. Nothing which Sir William Burnett and Dr Bryson have done or could do, should have induced the author to express himself in the manner in which he has done; and nothing, either in his own professional character or the official situation which he holds, can furnish either an excuse or a defence of such language. It is impossible to review further a work containing statements of this nature; and we willingly quit the subject.

ART. VI.—*Practical Pharmacy; the Arrangements, Apparatus, and Manipulations of the Pharmaceutical Shop and Laboratory.* By FRANCIS MOHR, Ph. D., Assessor Pharmaciæ of the Royal College of Medicine, Coblentz; and THEOPHILUS REDWOOD, Professor of Chemistry and Pharmacy to the Pharmaceutical Society of Great Britain. Illustrated by Four hundred Engravings on Wood. London, 1849. 8vo, pp. 890.

PHARMACY, like most other arts, may be distinguished into two great divisions; the Science of Pharmacy and the Art. By the former is understood the whole of that information which has been collected by different observers, regarding the natural history of articles used as medicines, their chemical properties and agencies, when separate and in combination; and, in short, everything relating to the modes of obtaining, preparing, and preserving them in a state fit for use. By the art of Pharmacy is meant the practice of those rules and instructions which science and experience have shown to be most successful in preparing drugs and medicines, and preserving them in those forms and conditions most fit for administration, and accomplishing their desired effects on the human body. Pharmacy may also be distinguished into Didactic or Descriptive Pharmacy, and Practical Pharmacy. By the former is meant that collection of information and instructions which it is necessary for the physician and apothecary to possess, on the physical, chemical, and medicinal properties of drugs and articles used as medicines, and the most approved modes of preparing them, whether separately or in combination, in order to obtain their proper effects on the human body. By Practical Pharmacy is understood the knowledge of all those mechanical operations and manipulations, and all those chemical processes and manufactures which are employed, either in preparing drugs and medicinal agents, or in manufacturing chemical medicines, in preserving them in fit states for administration, or in compounding them in such combinations as the physician and surgeon require.

Pharmacy has been hitherto considered as a part of chemistry, and a part of materia medica; deriving its chemical processes and manipulations from the former, and many of its details from principles and facts furnished by the latter department of knowledge. Pharmacy, nevertheless, though it has been improved and simplified as chemistry has been studied and as the knowledge of matera medica has been cultivated, is not, properly speaking, the offspring of these services. It existed before them, and furnished all the facts of which at one period they could be said to consist. The first chemists were pharmacologists; and it was chiefly in examining the properties and studying the powers of medicines and drugs, that chemistry was learned and men became chemists; and the only knowledge of materia medica that was possessed was such as was known to the druggist and apothecary, and could be communicated by that skilful functionary. Many able chemists had their first lessons in the laboratories of the druggist and pharmacologist; and both writers on chemistry and materia medica willingly acknowledge their obligations to this source of information.

A natural consequence of this state of matters was, that Pharmacy as a science had no existence, and as an art it consisted of numerous routine processes, not always very rational, for the preparation of medicinal agents and the composition of medicines. When chemistry came to be studied as a separate and distinct branch of knowledge, it rose into dignity in proportion as its applications and powers opened up extensive views, while its original handmaid was kept in a situation of humble usefulness. Pharmacy was either not taught at all, or it formed a small and not very important part of the course of chemical instruction. This arrangement was good for neither science; and the mutual relations of the two sciences are now better understood and more profitably applied. While chemistry stands by itself as the great investigator of every minute action in the organic and inorganic world, pharmacy retains for her own domain the means of ascertaining the qualities and the properties of drugs and all articles used as medicines, the proper modes of preparing them and combining them, and performing all those operations and processes by which their purity may be insured, their efficiency as agents may be depended on, and their employment in the treatment of diseases may be regulated.

Pharmacy, both as a science and as an art, has, during the last thirty years, been making greater progress in Continental countries than in Great Britain. The pharmaceutists of France and

Germany have cultivated the peculiar details of that department with so great diligence and industry, that they have invested the science with a degree of importance, which it nowhere else possesses; and their familiarity and expertness in its practical details and manipulations have given them a degree of weight as pharmacological authorities which has not yet been accorded to the chemists and druggists of the British dominions.

Let us not, however, be misunderstood on this subject. We possess excellent treatises on didactic pharmacy, or that collection of rules and directions which relate to the preparation and preservation of drugs and medicines, and the formulæ for compounding those combinations in which they are most usually administered. Independent of the systems of didactic pharmacy contained in the different Dispensatories, the English prescriber and compounder has the Pharmacologia of Dr Paris, a work of much varied learning and accurate information, and the Manual of Mr Brande, which furnishes a useful compendious view of the history of simples and their properties, and of the most approved modes of preparing and compounding, as well as of administering medicines and medicinal compounds. These and similar works are mostly intended for the use of physicians and surgeons, and surgeon-apothecaries; and though useful to chemists and druggists, they do not contain all the information which these assistants to the art of medicine require to possess. The art and practice of pharmacy, in short, embraces the knowledge of numerous minute details, some mechanical, some hydraulic, some neither one nor other, and which may be designated as technical and artistical, which are quite essential to the successful and economical management of the business of a druggist, and yet which are either not taught at all in any systematic work on pharmacy, or are mentioned in a manner too cursory to be of any use. Many processes also are undergoing frequent improvements and simplifications, by which they are rendered more efficient and less expensive. The operation of distillation alone, which is often performed on the small scale by chemists and druggists, has been in its details much simplified and rendered greatly more perfect than twenty years ago it was. The preparation of extracts and infusions *in vacuo* is also a department partly new and certainly much improved. Even the mechanical processes of grinding and reducing to minute powder, have been rendered more easy and more economical than they formerly were. In the modes of removing from one vessel to another different solutions and liquids, varying in density, numberless minute attentions are required, which can only be learned by practice in the laboratory.

For communicating the knowledge of all these details and varieties, no distinct or exclusive treatise has hitherto been available to the English druggist; and all the mysteries of his art the apprentice usually acquired from his master or his master's assistant. In Germany, Dr Mohr, an eminent practical chemist and druggist, has thought it proper to compile a code of familiar and intelligible instructions for the use of those who were to be devoted to this branch of medical practice. This manual is now published in England, with various additions and necessary explanations and comments, by Mr Theophilus Redwood, whose services in editing a new edition of Samuel Gray's Supplement to the Pharmacopœia were noticed in the seventieth volume of this Journal.

The work, thus modified and adapted to the use of the English pharmacologist, is in all respects well qualified for the purpose proposed. It presents, in a sensible and judicious form, all the requisite information as to the details of conducting the business of chemist, druggist, and apothecary, and will be found a most useful and indispensable guide in the laboratory and manufactory. The work, indeed, cannot justly be looked on as a mere translation of the treatise of Dr Mohr. It contains only those portions of that treatise which are generally useful, and which were found convenient for the English pharmacologist to know. But the additions and comments by Mr Redwood, which amount to at least two-thirds of the volume, render it a new performance, and, as such, deserving the particular acquaintance of the English reader.

The whole volume, in its present form, consists of three divisions: I. General Arrangements of the Shop, Laboratory, or dispensary; II. Special Arrangements, embracing an Account of the Necessary Apparatus and Operations, Mechanical, Chemical, and Technical; and, III. The Business of Dispensing Medicines.

Under the first head are arranged rules and directions for the best methods of warming, lighting, and ventilating the shop or dispensary; directions for fitting up and arranging the laboratory, store-room, store-cellar, drying-room or loft, and the powdering-room. Here are given detailed accounts of the most approved methods of fitting up these establishments, and furnishing them with the proper stoves, furnaces, evaporating vessels, conserving boxes and bottles, and means of ventilation, and maintaining an equable temperature.

Under the second head, or that devoted to special arrangements, apparatus, and operations, is given a minute and detailed account of all the contrivances, technical, mechanical, and chemical, for conducting the various operations required by the manufacturing chemist, druggist, and pharmacopolist.

Here are described the drying closet, the steam apparatus of John Beindorf, Gadda's condensing apparatus, with the method of using them; the apparatus for preparing infusions and extracts; the stirring apparatus; the steam-boiling apparatus; and sundry useful processes and contrivances in the method of preparing aqueous extracts. Next follow alcoholic and ethereal extracts, and the preparation of tinctures, with the uses of the horizontal press, the vertical press and the hydraulic press, and the various details of the processes of expression.

These are followed by rules for conducting furnace operations; descriptions of the different sorts of furnaces; distillation in glass and earthenware vessels; dry or destructive distillation; distillation of waters and essential oils; the preservation and rectification of essential oils, and the rectification of ether. Next are treated the modes of producing and causing the absorption of the different gases, and the means of procuring the escape of those that are noxious; sublimation; the processes of filtration and clarification; comminution of vegetable substances; pulverization of drugs; granulation of metals; elutriation and decantation; rules for their weighing and measuring accurately, and with despatch; the methods of determining the specific gravities of solids and liquids; the art of fitting bottles with stoppers, and extracting them when immovably fixed; the methods of drying bottles, flasks, and similar vessels; the art of tying knots of different kinds; the art of cutting, drilling, and bending glass; that of connecting apparatus by lutes and other means; that of coating glass and porcelain vessels with copper; the mode of preparing waxed paper; the methods of casting in moulds zinc, caustic potash, and lunar caustic; and a short description of a closed operating chamber for conducting processes in which are evolved gases which are corrosive and otherwise injurious.

The descriptions of all the details now specified form the greater part of the treatise, amounting to about five-sixths of the whole volume.

The residual part is devoted to the explanation of the method of dispensing medicines, and the rules and precautions required to be observed in that duty. Excellent rules are delivered for the best modes of preparing and keeping ready, when practicable, all those extracts, pill-masses, infusions and decoctions, powders, pills, and lozenges, which are most commonly required and ordered in prescriptions, and for performing all those delicate operations in pharmacy which are often necessary in the administration of medicines, nauseous or otherwise difficult to be taken. In the directions for the preparations of pills, are offered, on the most suitable excipients, some useful observations, which deserve the attentive consideration of physicians and others who prescribe. This part of the details of pharmacy is often so little understood by physicians, that it is not unusual to see in their prescriptions substances ordered to be united, which either cannot be united, or which impair the efficiency of the pill. In short, there are here given so many excellent and useful practical directions, which we happen to know from experience cannot be acquired without long familiarity with the details of pharmacy, that we hesitate not to say, that no physician can prescribe with any reasonable prospect of success without knowing them intimately and studying them carefully. It is possible that by reading the directions given in this volume, he may neither know all, nor remember what he has read. But this may be asserted with certainty, that unless he has studied the directions, rules, and suggestions here given, he must be quite unable in many instances to prescribe properly; and if he do become acquainted with these directions, he will prescribe with much greater comfort to himself and advantage to his patients than if he had remained ignorant of them.

The volume is altogether one of great and indispensable utility to the druggist and compounder, and a most useful guide to all branches of the profession. It is illustrated with most beautiful and correct wood-cut figures of the various sorts of apparatus.

ART. VII.—*Lexicon Medicum; or Medical Dictionary: Containing an Explanation of the Terms in Anatomy, Human and Comparative, Botany, Chemistry, Forensic Medicine, Materia Medica, Obstetrics, Pharmacy, Physiology, Practice of Physic, Surgery, Toxicology, and the Different Branches of Natural Science connected with Medicine; together with a variety of information on all these subjects.* By the late ROBERT HOOPER, M.D., F.R.S. Eighth Edition, Revised, Corrected, and Improved, by KLEIN GRANT, M.D., &c. London, 1848, 8vo, pp. 1390.

THE Medical Dictionary of the late Dr Robert Hooper has been so long a favourite with the profession, and a companion so necessary and useful to the general practitioner, that it is not wonderful that, after the death of the author, it should be accounted worthy to be republished in a condition becoming the subsequent progress of medical knowledge.

As the dictionary was to the author a work of great labour, so was it to medical readers one of much utility. Facility in reference, readiness in communicating information desired, variety and brevity, were all united with as great skill as could be expected in a work on a scale so comprehensive.

The present editor, who has now, to the best of our remembrance, superintended twice the publication of this useful work, has performed with great industry, adequate information, and much judgment, a duty requiring much labour and perseverance, and not free from difficulty. Dr Grant has exerted himself in giving all necessary information on so great a variety of subjects, in a condensed shape, which is indispensable for the student and general practitioner, whether in town or country. In its present form it is a most useful performance.

PART III.

MEDICAL INTELLIGENCE.

I. MEDICAL THERAPEUTICS.

Treatment of Neuralgic Disorders by means of Transcurrent Cauterization. By M. A. Notta, Resident Pupil of the Hospitals (Univ. Medicale, October 1847, et Archives Generales, 4ieme serie. T. xv. 1847.)—The author directs attention to the employment of the actual cautery in the treatment of neuralgic disorders, as it is conducted by M. Vallin at the Hotel Dieu. Among thirteen cases given,—in two, the patients were affected with dorso-intercostal neuralgia; in ten, with sciatic neuralgia; in one, with trifacial and suboccipital neuralgia. Six of these patients were from 30 to 39 years; six, from 47 to 50; and one was 18 years of age. Half of the patients were of strong, robust constitutions; half were enfeebled by wretchedness and privations; and two laboured under organic affections. The disease had continued from two to three weeks in four cases; from two to five months in four cases; from eight to ten months in three cases; and in two cases from two to four years. All the patients presented well-marked symptoms of neuralgia,—that is, circumscribed neuralgic points painful on pressure,—and with shooting pains along the course of the nerves. The pains were in general acute, and sleep was more or less disturbed. Among ten persons affected with sciatica, six could neither walk nor turn in bed. Four among the thirteen had been treated by remedies which had afforded either no relief, or only temporary relief.

In all these thirteen cases, cauterization was employed in the following manner.

The patient being placed in a suitable position, and the line to be traversed by the glowing iron having been traced in ink,—a circumstance absolutely necessary in regions in which cauterization requires to be performed with great precision, for instance, the face,—ethereal inhalation is commenced. As soon the patient is insensible, the operator rapidly traces, with the knife-like cautery heated to a red-white, along the course of the nerve, one or more radiating lines, taking the precaution to secure the patient, to avoid involuntary movements which he might perform. The cauterizing being completed, compresses, dipped in cold water, are applied over the course of the burned lines. The cautery, in traversing the surface of the skin, forms on it brownish lines, caused by the disorganization of the epidermis. Next day, the lines have a more uniform colour of dull red-brown, and are dry. The contiguous portion of skin is very slightly crisped. The heat is not great, and the pain is very endurable. The second day after, there are seen along the course of each margin of the fire-line, a little circumscribed red, of variable breadth. The following days, the heat and tension of the skin cease; and in the course of five or six days, the epidermis, or rather a brownish crust, which is formed, drops off without suppuration, leaving a red, smooth, uniform surface, the mark of which is at length completely obliterated.

As to the therapeutic effects of transcurrent cauterization, the most remarkable is the rapidity with which remarkable relief follows. Five or six hours after, movements are practicable, and sleep returns the subsequent night. In twenty-four or forty-eight hours, the shooting pains had completely ceased. As to pains caused by motions and pressure, it was difficult to ascertain their disappearance before the burnt line had ceased to be painful. Nevertheless, on careful examination, it was possible to be convinced that, in eight cases of sciatica, these two forms of pain had gradually disappeared in from two to four days; and in five cases, two of which were of sciatica, two intercostal neuralgia, and one trifacial neuralgia, pain was gone at the end of twenty-four hours. It has in some instances happened that pains have remained confined to one or two points, and then it was requisite to have recourse upon these to a new cauterization. In very obstinate cases of neuralgia, it has been requisite to follow, as it were, the pain with the red-hot iron, as is usually done with blisters. In conclusion, among thirteen patients, ten,—of whom seven were affected with sciatic neuralgia, with intercostal neuralgia, and with trifacial neuralgia,—were completely cured, two derived remarkable relief, and only one derived no relief. These three last were cases of sciatica.

The number of burned lines employed at each cauterizing was not great; three or four lines for removing a neuralgia of from six to seven intercostal nerves, and one or two lines for removing a case of sciatic neuralgia. These lines were applied along the course of the nerves, and in the whole space where were painful points, taking care to draw the cautery over the greatest number of these points, avoiding, however, the intersection of these lines, upon the ground that at the point of intersection an eschar would be formed, and consequently suppuration and an indelible scar.

The advantages of this method of treatment by cautery over that by vesication, are shortly enumerated in the following manner:—The application is less frequently repeated, since in little more than two-thirds of the cases, one single application is sufficient. The pain is greatly less, as the patient is etherized. The remedy is greatly more effectual, as neuralgic disorders which had resisted the application of blisters were removed by the actual cautery. Lastly, the cure was more speedy. Such are the grounds which assign to transcurrent cauterization an unquestionable superiority over treatment by blistering.

The analogy between this employment of the cautery and that practised by Dr Corrigan and Dr Day, as noticed at page 244, is too obvious to require more than mere mention. In neither case is a complete destruction of the skin, or the formation of an eschar, recommended as necessary. The method of M. Valleix appears, nevertheless, to be more powerful and more efficient than that by the cautery heated by the spirit-lamp. On the other hand, we believe that though M. Valleix seems to think the formation of the eschar unnecessary, and to be avoided, yet there are cases in which this degree of the remedy will be indispensable. The effect of the cautery, both actual and potential, is very often, if not always, in proportion to the violence and the severity of the action which it produces; and, in various instances, it is quite impossible to produce curative effects without forming an eschar, and inducing suppuration more or less complete. To this rule, of course, the face forms an exception; and there the formation of an eschar is, if possible, to be avoided.

If the induction of insensibility, previous to the application of the cautery, be indispensable, it would be an improvement to substitute chloroform for ethereal inhalation.

II. SURGICAL THERAPEUTICS.

On the Employment of Oil of Turpentine for Arresting Hemorrhagies, as originally proposed by James Yonge of Plymouth, in 1678.*—In last volume, in the account of the instructive and useful volume of Dr Seymour, that gentleman, it was stated, reposes great confidence in the use of oil of turpentine, taken internally, as the means of healing and cicatrizing the chronic ulcer of the stomach, and arresting the hemorrhage often connected with that disease, also in suppressing the hemorrhage which takes place in hysterical and amenorrhoeal females. This remedy we have also employed with considerable advantage in the treatment of hemorrhage from the intestines and various other of the mucous surfaces, especially during the presence of purpura; and we have every reason to believe that it exerts a true power, as a means of suppressing hemorrhage. This power it is not very easy to explain, nor perhaps is it requisite. In the case of hemorrhage from the stomach or bowels, it is possible that it may effect on the vessels of the mucous membrane some change, which, aided by the other remedies usually administered in this order of cases, may tend to empty the bleeding vessels, close their openings, and re-establish the due balance of the circulation, which is in all this order of cases more or less deranged and subverted.

It is different with its employment as a means of suppressing external hemorrhage. Here it may act directly on the vessels. This argument, nevertheless, will not exactly answer as to the mode of administration lately recommended by Mr Vincent, who, in cases of hemorrhage, uses it both locally and by internal administration.

It may be proper to mention, that John Hunter had great confidence in the styptic properties of oil of turpentine. In treating of the suppression of hemorrhage, " A dossil of lint," he says, " dipped in oil of turpentine, after having first wiped the wound clean, in order that it may reach the vessel, is the best, and may be renewed pretty often. I have seen it immediately stop vomiting of blood from the stomach, after all other means had failed, given internally with white of egg, as often as the stomach would bear it. In external hemorrhagies, where it had not the desired effect applied externally, I would give it internally. It is the best, if not the only true styptic. Thus in a case of nasal hemorrhage, which nothing would stop, I gave ten drops of oil of turpentine in a draught, and repeated it every two or three hours, which entirely stopped the bleeding in less than twenty-four hours; and it never returned."†

On this passage a note is given to the following effect: " It is scarcely necessary to observe, in the present day, that this eulogium on the oil of turpentine is unmerited." What then becomes of the recommendations lately given by Dr Seymour and Mr Vincent? It is supposed that John Hunter derived his ideas of the styptic properties of oil of turpentine from the book of James Yonge.

The local application of this agent was first proposed in 1679 by Mr James Yonge, a naval surgeon, in the reign of Charles II. His small treatise, though published in London in that year, is dated 5th July 1678; and at that period he speaks of himself as a young country or provincial practitioner.

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* Currus Triumphalis, è Terebintho; or an Account of the many admirable Virtues of Oleum Terebinthinæ, &c.; in Two Letters, the one to James Pearce, Esq., Surgeon to H. R. H. the Duke of York, and Surgeon-General to his Majesty's Royal Navy; the other to Mr Thomas Hobbs, Chirurgeon in London. By James Yonge. London, 1679. 8vo, pp. 120.

† Lectures on the Principles of Surgery. Works by James F. Palmer. Vol. i. p. 539.

In this publication, the author,—after taking an extensive and minute view of the means then in use for suppressing hemorrhage from wounds, especially in cases of amputation, in sea-fights, as by cooling and causing stagnation of the blood, by escharotics, by the actual cautery, by the application of pulverulent substances, by styptics, by direct compression by button, compress, or the finger, by glutinous and villous substances, as the hair of animals, by ligature, by various astringents, and by dividing the vessel,—narrates seven experiments made with oil of turpentine, by which he thinks that he proves that the powers of that agent, in stopping the bleeding from wounds, are greater and more certain than those by any other method. These experiments would not in the present day be regarded as very conclusive. The first three show that oil of turpentine, if heated, is liable to be converted into firm, tough, adherent varnish, which he infers must therefore close, shut up, and contract the mouths of vessels inwards. It is manifest that, as he used this agent hot, evaporation of the volatile portion took place, and then the resinous part formed the varnish.

At the same time, as his reasonings are closely connected with the four last experiments, and are deduced from them as corollaries, it may be proper to show the train of reflection by which Mr Yonge was led to his conclusions.

" *Experiment* 4. Heat an ounce of *oleum terebinthinæ,* in a blood-porringer that would hold three ounces; let a vein or an artery bleed it full, and you shall find the blood instantly to coagulate,—not a loose frangible curdling as acids produce therein, but a more tough, fast, and, as it were, gummy condensation. Let it stand a while, and the oil shall all of it separate and superside; the longer it stands, the harder the blood grows, especially the surface, which will become very tough. This experiment I made many times, and (which is very remarkable) always found it without any *serum,* though the rest of the blood drawn simply, and set to cool in other porringers, did abound therewith. Now view this condensed blood by a microscope, and it appears very firm, compact, close, and opaque; but the other, though severed from its serum, shows thin, and almost translucid, that, curdled by a solution of *vitriol,* looks like a heap of loose black dirt or gravel; the former only resembling black pitch, by which, that it's fittest for the performance, we shall by and by discover.

" Ex. 5. After the blood so condensed hath stood two hours or thereabouts with the oil upon it, the surface of the blood becomes whitish; view this also through the glasses, and you will find there to be a number of light spots on the rim thereof, having various shapes and figures, neither round, square, nor regular. I endeavoured to move it with a needle, whilst mine eye was on it through the tube, by which I discovered it to be a colour of the superficial blood, not any milky separate matter as I apprehended.

" Ex. 6. At the same time, thrusting the point of the needle through the surface, and lifting it up to see how far that whitishness continued beyond the rim of the blood, I found it no deeper than the upper skin; but what was very observable, the needle, though fine pointed, when I lifted up the surface therewith, came not through it by one division thereof, as it did in other coagulations, but forcing up the hardened superficies, it broke at some distance round about it, so that a flap was thereby made like a trap-door or a valve, which, upon withdrawing my needle, fell into its place again—a clear proof of its being very firm and tough.

" Ex. 7. This coagulated blood, made so by oil of *turpentine,* is a most incomparable balsam to heal wounds by consolidation, or to digest and incarn those that require it. It is known that internal wounds and ulcers being incapable of local application, are cured by vulnerary diets, which, say the learned, is by heightening and improving the balsam of the blood. Now, to make it a good topical balsam, I think nothing exceeds the celebrated oil of ours, as any one that will experiment it, may easily assure himself; for though there be no sensible commixture, yet after the subsiding blood is freed from the oil swimming a top of it, yet by the smell, it appears considerably impregnated therewith.

"Sir, I want leisure to make other trials, necessary to a full discovery and solution of the question, how this medicine stops *hemorrhagies* of wounds."

He then expresses a suspicion that adulterated oil of turpentine is often furnished to surgeons by chemists, and cautions them that it is indispensable to have the medicine genuine.

"I have some reason to doubt that the chemists do often abuse us in the oil commonly sold us for a lesser price by far than the *terebinth*, from which it ought to be drawn. There is a base *turpentine*-like substance called commonly *terebinth*, brought from France, drawn from the fir and other trees, much used to this purpose, which is no more the gum of the turpentine tree than tar is. It were to be wished, care were used to prevent those great abuses in chemical preparations. The public laboratory, new set up by the Apothecaries' Company in London, is a design of great utility and public advantage, which may in time secure us such medicines as may be relied on."

Next follow his directions.

"The directions necessary to be regarded and followed in the use of this medicine, to wounds, please to receive thus promiscuously, as they occur to my memory.

"And, 1st, I must not forget to tell you, that it ought to be very hot, and more or less so, according to the urgency of the flux, the temper of the patient, the quickness or flatness of the spirits, and native heat of the part; and because in heating it, it is very apt to flame, and when so, is difficultly extinguished; I always in amputations or large wounds, have two vessels with the oil in them, ready heated; that if one kindle, the other may serve. I do also heat it on glowing coals that have no flame, and in a broad deep vessel, that may sufficiently intercept the force of the fire from kindling the exhaling spirits.

"This circumstance, Sir, seems to render it difficult, if not impossible, to be used in the great fights at sea; partly from the hazard and inconvenience of fire, partly from the tediousness of heating it, and the aptness to flame, while so heating, which would be very perilous; to remedy, and to prevent all which, I have considered of a very effectual way, which is to have a copper vessel, with a long neck, flat bottom, and a narrow mouth, like a chemical matrass, or bolts-head, to which I would have either a close stopper, or a cover, so exactly fitted, that the spirituous parts of the oil should not, by continual heat, evaporate away; this would be kept in due heat by a very little fire, not more than is necessary to heat cauterizers, and without any danger of flaming, nor would its continuance on the fire rebate its virtue; for, by the vessels being closed, as I have said, the spirits and evaporative parts would only circulate therein. Some few of the more volatile would be spent upon every opening it, which, however, might not be inconvenient, since by discharge, the medicine is not so potentially hot, and thereby fitter for recent simple wounds. By this means, having it always ready, it is but to pour a necessary quantity into a porringer or other convenient vessel, at the time you are ready to use it; the different particular ways of which I forbear here to recite, because in the histories or observations, they will be sufficiently related.

"If the vessel bleeding be large, and the flux impetuous, as the crurals, when amputation is made above the knee, then I lay large buttons of tow dipped therein on the ends of them. In most other stumps, I leave all to a large pledget or two, of a reasonable thickness, which being immersed in the same, and applied over all, I lay one or more of the like pledgets, armed with the common restrictive of bole, &c., together with bladder and bandages, moist with water and vinegar.

"In stabs and narrow wounds penetrating the fleshy parts of the thigh, leg, arms, &c., where by reason of a vein or artery hurt, a great hemorrhage ensueth, I would inject my *oleum terebinthinæ* made duly hot, till the whole cavity were replete therewith, and there retain it, by stopping the orifice or orifices with my hands a few hours, by which it would become undoubtedly secured.

"I have sometimes the next day, after this medicine of ours hath been applied, found the edges of the wounds and stumps blistered as far as the pledgets have extended, the bladders of which have been filled with a milky matter, the cause thereof I always found to be the too hot application of the medicine, when haste hath prevented consideration and occasioned its being so applied; and to a person of a very hot constitution, the white matter filling those little vesications, though thin, is the strong digestive effect of its cause. I never much regarded them, other than to snip them with my scissors, and lay on it a little *unguentum album camphoratum*, which drieth them by the next day; wherefore those to whom the appearance may be strange and surprising, have no reason to be discouraged thereat, or afraid to use the medicine after this intimation, nor to apprehend it gangrenous, as one lately did, and used a lixivium to cure it, though he were no stranger to the use of the oil, to this end. Other ill effects I have scarce found (except the symptoms in the last observation were such); but that those wounds to which I have applied it have been as easy as any others to which I had not used it.

"Lastly, To amplify and perfect one period, which, upon a review I find defective, I must inculcate my direction, that where digestion, more than constriction is designed, and in all young hot choleric constitutions, I prefer the oldest thickest oil, and which smells least, but where a strong coagulation is necessary, because a large vessel is hurt, or where a venene gangrenous sanies is to be corrected and absumed, where the part is afflicted with a cold distemperature, convulsion, palsy, insensibility, and of debilitated heat, then the thinnest and most spirituous.

"The strong smelling oil is the most pertinent. These warm productions of this balsam seem liable to an objection, which you shall find made and answered in the conclusion of the last observation.

"The restraining hemorrhagies of wounds, was what principally occasioned this recommendation of oleum terebinthinæ."

The following are a few of the cases in which hemorrhage was stopped under the use of oil of turpentine.

1. "A man of a plethoric habit, aged about forty years, was sent to the hospital from his Majesty's ship the Adventure, being shot through the right elbow with a musket-bullet, which had lacerated the bones, and torn the vessels exceedingly; the member from the wound downward was œdematous and senseless for want of a due influx, the vessel being so hurt. In short, an amputation became necessary, and I accordingly took off the member in presence of two chirurgeons, besides my own people. My ligature and other preparations were common; after excision, the bone being also divided, I covered the whole wound with one well made pledget of fine tow, dipt in hot oil of terebinth; upon which I laid two more, armed with the common defensative, and bound it up S. A., dipping my linens in posca. Taking off my dressings the next day, I found the whole wound look excellently well, with a white tendency to digestion; some little vesications were on the edges, but without smart or inflammation; those I dried up with unguent. album, first snipping them with my scissors. I

repeated my dressing of oleum terebinthinæ once more, and in a little time healed the wound."

2. "About the same time, I was called to one Mr Collings, a woolsted comber, of sixty-five years old, who, by a malignant fever (under which he had laboured five weeks), was not only much emaciated and dispirited, but had a confirmed sphacelus of the right leg, from the knee downward. I was in company with some other chirurgeons when I was called to this patient, and understanding the business, I invited them to see it. In their presence I made divers large and deep incisions, but neither sense nor blood appeared, but a very noxious scent. We all concurred in opinion, that a speedy amputation was to be made. While my servants were preparing the dresses, we discoursed the place where the work was most needful, and what applications were most proper; they advised the former to be done above the knee, and the latter to be hot Egyptiacum, and spirit of wine. I resolved another course, for making my incision a little above the usual place, below the knee, and there dividing the bones; I laid on two pledgets, dipped in very hot oil of turpentine, and common bandage over all. There issued a little grumous blood after the incision; and because I found some remaining parts of the cadaverous flesh, I touched the whole stump with a cauterizing iron, not to stop any flux, but to assist the exfoliation and separation of the sloughs, quicken the life of the part by so attracting the spirits, and killing any remaining venom and sanies. The next day, having prepared lixivium ex. absinth. scord. rutæ. centaur. ciner. lignor., cocted in sea-water, and impregnated with brandy, I fomented the stump therewith, and dressed it again with my hot thin oil of terebinth. The next dressing I found the reliques of the necrosis dryed up like a crust, and considerably separated from the quick flesh, from whence I saw good tokens of digestion; the old man was very courageous. I continued (in all four days) to dress with ol. terebinthinæ. After seven, the sloughs came all away, and never did I see fairer digestion; but when the quick and sensible parts became naked by the exfoliation of these eschars, though my dressings were as benign and mild as could be; yet the smart and pain happening to disturb him of his rest, under which his depauperated spirits were unable to subsist, he languished to death, though the wound altered not, and that I gave him high cordials very liberally, with what else art directed; I being very greedy of the recovery of so remarkable a patient, after such prosperous beginnings.

"That which made me prefer oleum terebinthinæ here, was the success thereof in two such cases on a couple of young men, whom I had amputated in the mortified parts of both their legs, and found that a soft cautery, and this medicine, did incomparably assume the sanies, and excited the spirits of the adjacent sound parts, so as to induce a speedy separation and good digestion. My success, I say with them, encouraged me to hope the like here, though theirs were both legs taken off within twenty-four hours' distance, and not wholly quit of a spotted fever, in which, having been delirious on board the King's ships, to which they belonged, they had either kept their legs over the hammocks (it being a very cold winter), and so numbed and mortified them, or they became so from the stagnation of the blood, the effect of that coagulation, which highly venene diseases do usually beget therein, if it be not carefully diluted, kept fluid, and in warm motion by proper sudorifics."

3. "A carpenter, by name Richard Sellar, looking up towards the top of an house whereon some helliars were at work, by chance a shindle-stone falling down, alighted on his face and made a long deep incision from the right nostril towards the grinders; an artery that was wounded thereby spouted out blood in as large a stream as an ordinary syringe-pipe could vent. I stopped it with my finger, whilst my servant warmed some oil of

terebinth in a uvula spoon; when it was ready I withdrew my finger from the bleeding artery, and it spouted out as before. I immediately poured the hot oil upon it, which instantly stopped the bleeding like a charm, and permitted me to stitch it up without any flux. When I had so done, I laid a pledget of the same over the closed lips, and a plaster upon it; the outward lips soon consolidated, leaving no very apparent cicatrix; the inside kept open somewhat longer, thereby expediting the unition of the outward part, by which a very fine seam was made.

4. "Shortly after this came to me a woman, cut from the middle of the nose down to the right end of the mouth, by a knife done by a Dutchman, who pretended she had defrauded him. There issued such a stream as from the last mentioned, and was after the same manner stopped, with no difference in it, or the success, only that here a more inconspicuous cicatrix was induced, whether from the dry stitch which I here made, or the fineness of her skin, or because the penetration of the cheek was larger, whereby the matter had a more liberal vent that way, I cannot determine."

5. "Anno 75. I was sent for to a Dutch seaman, who being gotten drunk, threw himself into his cabin with all his clothes on. It unluckily fell out that he had in his pocket a sharp-pointed knife, such as they usually carry, and that it lay in so ill a posture, that the weight of his body forced the point through sheathe and clothes, and ran up above three inches, entering about the middle of the thigh, obliquely towards his buttocks, so that the point might be an inch and half directly in from the skin under which it lay. I drew it out, and found no part of it broken off. The man complained of great pain, and there flowed much blood. I then injected warm oil of turpentine, and put up above half way a thin flammula dipped in the same, then rolled him up, drawing also about ten ounces of blood from the arm. The man slept well all night, and after two days, I using nothing but a pledget and a plaster on the orifice, the solution being all united, I let him walk about. I bled him because he was plethoric, and I intended to heal the wound by sympathy."

6. "Anno 76. A young man about twenty years old, living with Alderman W., whose nephew he was, did castrate himself by griping up the testicles, with the whole scrotum in one hand, and with a keen knife in the other, cutting them off close to the body. The sudden pain and effusion of blood made him faint and fall back on the bed, where he sat while he thus acted Origen secundus. He bled very largely before any one discovered it. When I came, finding such a large flux, and the man much weakened, I hastily griped up the wound in my hand, thereby stopping the excess of the hemorrhage, while Mr Munyon prepared the dressings. When they were ready, withdrawing my hand to make way for their application, the blood forthwith spouted out, as it had been from a small quill; but we soon stopped it by laying on the divided vasa buttons of tow dipt in the hot oil of terebinth; and over all a large pledget dipt in the same; over which also we put two or three pledgets more armed with the common defensative and boulsters of linen, moistened with posca, and so rolled him up. The blood instantly staunched; but the refraction thereof threw him into a syncope, together with coldness of the extreme parts, no pulse, &c. I concluded death would follow; we gave him a glass of sack while the following mixture was preparing, of which he afterwards drank liberally, till his spirits were recovered to a good degree; R: Aq. Mirabilis, Flor. paralyseos, Melissæ, Cerasor. nigr. an 3 oz. Syr. Croci optimi 2 oz. Conf. Alkermes S. M. 3 dr. Spec. conf. Hyacinth. 1 dr. Pulv. guttatæ 2 scrup. misce.

"We opened the wound the next day, found tokens of good digestion, and as fair as heart could wish. It was long ere he could recruit his spirits, so much exhausted by the hemorrhage, but the wound in a month's time was almost cicatrized, so as he followed his business."

7. "A cooper, striking hard with his addis on the chime-hoop of an hogshead standing on end, and missing the place whereat the blow was designed, the tool flew out of his hand and hit him across the instep or tarsus, making a large wound, dividing the veins, &c., to the bone; he bled very much; he was a thin man, and of hot sharp blood. I dressed him with hot ol. terebinth, which restraining the flux, gave me opportunity to stitch up the wound. Some little vesications occurred by the medicine meeting such a habit, but it begat no trouble at all."

This sketch he closes with the following remark:—

"Sir, it were endless to enlarge upon this matter; I suppose here is enough said to satisfy every artist. If they are not persuaded hereby, let them experiment the thing, and if it answers not all I have said of it, they will not be so fortunate as myself. I am sure I have been very faithful in the relation of fact; how defective in the theory, I must leave it to the judgment of every ingenious reader."

The following passage from another part of the same treatise, shows that he had formed a distinct conception of the utility of compressing the trunks of arteries by a pad like that of the tourniquet; and, probably, this is the earliest mention of that contrivance.

"Sir, I hope it will not be altogether impertinent, if I here take occasion to recommend to the young practitioner, one way of ligature very useful in amputations, especially above the knee; that is to say, a wad of hard linen cloth, or the like, inside the thigh, a little below the inguen; then passing a towel round the member, knit the ends of it together, and with a baton, a bedstaff, or the like, twist it till it compress the wad or bolster so very straight on the crural vessel, that (the circulation being stopped in them) their bleeding when divided by the excision, shall be scarce large enough to let him see where to apply his restrictives; nor shall the pain of that operation be comparable to what it would be, were not the member numbed by the compress. Yet I would direct him in all constrictions, whether by gripe, narrow ligature, or this we recommend, to slacken it a little before the application of his dress, the better to find by their bleeding where his care and applications are most needful; for want of this necessary caution, poor patients do often lose much blood unknown to the chirurgeon, it having lain concealed within the encompassing bladder. Nor is inartificial ligature and many thick pledgets and boulsters of less inconveniency and mischief; for that they often imbibe the extravasate blood, concealing many large expences thereof."

At the end of this treatise is a letter addressed to his esteemed friend, Mr Thomas Hobbs, chirurgeon in London, discovering a "New Way of Amputating Large Members, and a more speedy, convenient Method of Curing Stumps than that commonly practised." This shows that Mr Yonge was the true author of the method of flap-operation, the merit of which has usually been ascribed to Mr Alanson. In short, Mr Yonge appears to have been a person of great originality of mind, and much ingenuity and resource as a surgeon; and it is evident that he was much esteemed by his contemporaries, especially his brethren in London.

III. THERAPEUTICS OF DISEASES OF FEMALES.

On the use of Bichloride of Mercury in Hypertrophy and Induration of the Uterus, with Remarks on Retroversion and Retroflexion. By Dr Oldham. (Guy's Hospital Reports, 2d Series. Vol. vi., Part i., Oct. 1848, p. 161).—In this paper, Dr Oldham offers some useful remarks on the use of corrosive sublimate or bi-chloride of mercury in two morbid states of the uterus; the first, an affection of the body of the womb, characterized by vascular engorgement, enlargement, and hardening; and the second, a disease of the *cervix*, in which this part becomes bulky, hard, frequently nodulated, and covered more or less with a surface of vascular granulations, commonly described as ulcerations of the *cervix uteri*.

Congestion of the unimpregnated uterus, followed by increased bulk, weight, hardening, and displacement, is one of the most common disorders of the organ. Considered in its etiological relations, chronic induration, or hard engorgement, may be either, 1. primarily an affection of the body of the womb; or, 2. it may be induced by ovarian irritation; or, 3. it may be the effect of disorder in the digestive organs, in which case it is generally associated with more or less copious elimination of lithic acid, and often with hemorrhoidal swellings.

1. The first order of cases are those most commonly met with in practice; and are immediately referable to labour or abortion. In many, the venous circulation is so deranged, that it never completely recovers itself, and the body of the womb remains large and congested. This, which forms the morbid hypertrophy of Lisfranc, is followed by induration and increased thickness of the uterine walls; and of this increase of matter displacement usually downwards and backwards is the general result. In the early stage, the organ is large and more or less displaced. By passing the finger to the upper and back part of the vagina, without touching the cervix, while the patient is lying either on the side or on the back, the swollen body of the womb may be reached, and the presence and extent of swelling ascertained. The uterus is painful when pressed; its structure yields when pressed; and attempts to replace it are attended with immediate suffering. Subsequently, when the uterine substance is indurated and permanently enlarged, it may lose this sensibility; and the finger recognizes only a firm globular body, generally occupying the upper and back part of the pelvis. This state follows puerperal metritis and hysteritis, when induced by sudden suppression of the menstrual secretion, or the use of irritating and astringent injections into the uterine cavity for the cure of disorders of its lining membrane. It is to be distinguished from karkinoma of the womb.

2. The second great cause of congestion and hardening of the uterus is irritation and congestion of the ovary, or ovaries, in which the Graafian vesicles and their contents are necessarily implicated. The influence which the ovary exists on the womb when in a state of functional activity, as during the menstrual periods, and when *ova* are undergoing detachment, is well known. At these periods, the walls of the uterus are in a state of vascular turgescence, swell considerably, and become softened, while the glandular system is in a state of excitement and irritation. Dr Oldham had already, from examining specimens of the dysmenorrhœal membrane and comparing them with slips of uterine *decidua* cast off in cases of abortion, become satisfied of the identity of the two; and the pathological nature of the membranous forms of dysmenorrhœa, with its previous congestion and uterine enlargement, became intelligible. He has known several instances of chronic hypertrophy and retroversion of the uterus take place in the course of long-continued membraniform dysmenorrhœa. These instances, therefore, Dr Oldham ascribes to the influence of the ovaries.

The effect of this ovarian excitement, Dr Oldham thinks may be illustrated by the phenomena of the womb in public females, in whom, in consequence of sexual excitement, similar orgasm, and similar changes in the uterine circulation, walls and membrane, are induced. The uterus in such instances is from two to four times the size of the healthy unimpregnated womb; the muscular tissue is as hard as a fibrous tumour; the mucous membrane of the body of the womb is opake and flocculent; the glands at the cervix are large and filled with viscid mucus; the coats of the arteries are more dense and more visible than usual; the capsules of the ovaries are thick, shrivelled and lacerated at different points; the Graafian vesicles are some of them from three to six times their proper size, and filled with clear fluid or blood; while others are collapsed and empty, with thick opake puckered tunics; and the intervening stroma is broken up by clots of extravasated blood in different stages of absorption and transformation. Over the interior of the uterus and Fallopian tubes is usually formed a web of false membrane.

3. Lastly, the uterus is liable to become the seat of vascular, mostly venous congestion, in consequence of disorder in the organs of digestion and assimilation. Most commonly this is induced by indulgence in full and stimulating diet, with habits of inactivity and indolence, and neglect of the periodical relief of the bowels; and it may be associated with an hereditary tendency to gout. In both instances uric acid is formed in excessive quantity, and may or may not be discharged. When discharged, relief follows.

The uterus, in such circumstances, is liable to become partially prolapsed, or to be retroverted, or otherwise made to deviate from its normal position in the pelvis, most commonly to fall lower than it ought to be. True retroflexion, nevertheless, as described by some authorities, Dr Oldham does not admit.

These morbid positions and conditions of the uterus are to be distinguished from the presence of fibrous and other tumours; from growths in the ovary and broad ligaments, and tumours attached to these parts; and from inflammation and induration of the pelvic cellular tissue.

The three principal indications in treatment, are, first, to reduce the size of the uterus; secondly, to strengthen those structures that have been weakened; and, thirdly, to improve the general health by removing and alleviating the symptomatic disorders, by which it has been deranged.

1. For accomplishing the first indication, namely, reducing the size of the enlarged uterus, the means are local depletion by means of cupping over the lumbar region; scarification of the *cervix*; and leeches applied to the cervix and upper part of the vagina; counter-irritation by blisters applied over the sacrum; iodine applied over the sacrum; the use of a liniment consisting of tincture of aconite, belladonna extract, and soap liniment, over the seat of pain; the internal use of iodine; and, above all, the internal use of bichloride of mercury.

The influence of preparations of iodine, Dr Oldham thinks, has been overrated; and he therefore recommends strongly, and preferably, the use of the solution of bichloride of mercury, either alone, or with any of the vegetable tonics, or a preparation of iron. This combination, he thinks, renders it peculiarly suitable and efficacious in diseases of the womb; and he thinks it may be given in doses of one or two drachms twice in the day, for three, six, or even twelve months, to delicate females, without causing hurtful results. It is, he adds, a perfectly manageable remedy, and very rarely salivates, unless given in large doses, or the patient be unusually susceptible to mercurial influence. For the last two or three years he has employed the solution extensively, both at the hospital and in private practice; and the degree of benefit which it accomplishes, with the small amount of evil, has led him to attach to it great value as a curative agent.

Its effects are slow, in consequence of the inveterate and obstinate character of the disorder. In some instances, however, it operates more speedily, and in the course of six or eight weeks may cause the absorption and disappearance of a considerable amount of hypertrophy of the womb.

Dr Oldham does not mention the preparation which he employs. But there is no doubt that it is that recommended in the London Pharmacopœia; and as this differs from that formerly, and even still with many in use, it may be proper to remind readers of its peculiar composition. The *Liquor Hydrargyri Bichloridi*, as it is termed in that work, then, is formed by dissolving ten grains of corrosive sublimate or bichloride of mercury and ten grains of sal-ammoniae or hydrochlorate of ammonia in one pint = 20 fluid ounces, of distilled water.

This is believed to be an improvement upon the solution of oxymuriate of mercury (*Liquor Hydrargyri Oxymuriatis*) of the old Pharmacopœia, which was prepared somewhat after the fashion of the liquor of Van Swieten, by dissolving eight grains of corrosive sublimate in fifteen fluidounces of distilled water, and then adding one fluidounce of rectified spirit. The objection to this solution was, that aqueous solutions of corrosive sublimate, unless carefully excluded from the light, undergo decomposition, forming calomel, which is precipitated, while free hydrochloric acid is left in the solution. It was found by Dr Davy, that this decomposition was actually accelerated by the presence of a small quantity of alcohol in the water, and, on the contrary, that the decomposition is altogether prevented by the presence of muriate of ammonia or of common salt. Mr Brande therefore suggested, so long ago as in 1833, that if to a sixteen ounce solution of corrosive sublimate, containing half a grain in the fluidounce, eight grains of muriate of ammonia were added, it would render the solution unexceptionable. This was accordingly done, in the last edition of the Pharmacopœia published by the London College. This solation, therefore, is the one which, we understand, Dr Oldham employs. One fluid ounce contains half a grain of bichloride, and, consequently, one drachm of the solution contains one-sixteenth of one grain.

In instances of granulations forming on the cervix, Dr Oldham recommends the use of the nitrate of silver as the most simple and the most safe local application. Of the employment of Vienna paste, the nitrate of mercury, the actual cautery, and the caustic potass,—indeed, the use of all violent escharotics,—he decidedly disapproves, as tending often to aggravate the irritative state of the *cervix* and *os uteri*, and leave, after their employment, hard and unhealthy *cicatrices*, and not unfrequently causing severe and unmanageable hemorrhages from the womb and adjoining parts.

One great advantage resulting from the use of the solution of corrosive sublimate he represents to be, that its employment enables the practitioner to dispense, to a great extent, with this local treatment.

Regulation of the bowels by small but suitable doses of laxative medicine he recommends, in order to prevent the bad effects of fecal accumulation, intestinal congestion, and disordered digestion. A combination of rhubarb, sulphate of potass, and some aromatic, is what he prefers.

2. As to local strengthening remedies, he recommends the use of the cold hip-bath, or a bath containing bay-salt and alum; suppositories of tannin; and decoctions of oak bark or tormentil, or solutions of sulphate of zinc, as injections.

Among means of mechanical support, he advises a well-fitting abdominal belt, to which is attached an under-perineal pad.

3. For fulfilling the last indication, he recommends the use of the magistery of bismuth, with a grain or two of extract of poppy, as means of allaying gastric irritation; and, above all, great attention to diet, avoiding the use of all stimulants; and change of air, if possible,—that is, for the patient to reside in the country, or by the sea-side.

IV. MISCELLANEOUS.

On the Destruction and Prevention of the Cimex Lectularius. By Dr T. Stratton, R. N. (Annals and Magazine of Natural History, January 1849.)—In the Magazine for the last two months are letters on the prevention of the bed-bug, the *cimex lectularius.*

This creature is much more common in America than in Britain; and this is supposed to arise from some peculiarity in the timber. I have directed to be used Sir William Burnett's Disinfecting Fluid, the solution of the chloride of zinc. It was applied, by means of a feather, to all the joints and crevices in the bedstead, and with complete success. The solution entering the wood, rendered it an unfit and probably poisonous habitation for the *cimex*. This method I consider superior to all the other chemical methods of destroying or of preventing the *cimex*, the excessive prevalence of which, at times, in ships, troop-ships, and barracks, ought to make the best preventive worthy of the consideration of medical officers.

The prevention of these animals is of more importance than some may at first suppose it to be. In some severe diseases, the disturbance they give the patient may greatly impede recovery; and I have heard of instances where soldiers in barracks, finding sleep impossible in bed, have gone out of doors, and, sleeping there, have been seized with inflammation of the lungs, or with other diseases, dangerous, and sometimes fatal.

Naval Assistant-Surgeons.—Resolutions adopted at a meeting of the Royal College of Surgeons of Edinburgh, held on Friday, 19th January 1849, relative to Grievances of Assistant-Surgeons of the Navy :—

1. That the College have long regarded the position of Naval Assistant-Surgeons on board of ship as unbecoming the members of a liberal profession, and unfavourable to the discharge of their duties.
2. That the College have endeavoured, by petition and remonstrance, to obtain redress of the grievances in respect to their social position under which these gentlemen at present labour, but without success.
3. That, until redress is afforded, it would not be proper for the College to exercise their privilege of recommending candidates for appointment in the medical service of the navy.

The resolutions were moved by Mr Syme, Regius Professor of Clinical Surgery, and seconded by Sir George Ballingall, Regius Professor of Military Surgery in the University.

The College resolved also to petition Parliament for the redress of the grievances of Naval Assistant-Surgeons, and the following is a copy of the Petition which is now (March 1st) about to be transmitted :—

To the Honourable the Commons of the United Kingdom of Great Britain and Ireland, the Petition of the Royal College of Surgeons of Edinburgh,

Humbly sheweth,—That the Assistant-Surgeons of the Royal Navy, many of whom are licentiates of this Royal College, are subjected to certain grievances, to which, in the opinion of your petitioners, a remedy ought to be applied by the Legislature.

That early in the present century, an order in Council was made which your petitioners understand has not been carried into effect, and in virtue of which, the medical officers of the navy were placed on the same footing, in all respects, with officers of the corresponding rank in the army.

That the Naval Assistant-Surgeons are the only officers of adult age who are excluded from the ward-room or general officers' mess; that they are consequently compelled to mess and associate with midshipmen, and naval cadets, gentlemen much their juniors, engaged in the acquisition of an elementary nautical education; that their position as gun-room or junior officers makes them ineligible to possess cabins, the only places of *bona fide* retirement for purposes of study; and that these circumstances are the sources of much vexation, discomfort, and sense of unmerited degradation to this most important class of her Majesty's servants.

But the College are far from wishing to found the present petition solely, or even principally, on the attention which is due to the feelings of the Assistant-Surgeons, inasmuch as its importance will appear far greater when considered in relation to their efficiency, and consequently in relation to the interests of the whole naval service. The Assistant-Surgeons usually enter the service at 22 or 23 years of age, and look forward to the higher responsibility of the office of surgeon at the end of seven or eight years. Their capability, not merely in their present rank, but in the higher rank to which they aspire, will depend in a great degree on the devotion of a large portion of their time to purposes of self-improvement. They may at any moment be called upon to treat the most difficult cases, to combat the most formidable epidemics, to dress the most serious wounds, and to perform the most unusual operations, without those advantages which the medical gentlemen of the army for the most part possess, of unlimited access to books, and of obtaining the advice and assistance, in all difficulties and emergencies, of the most distinguished medical men, military and civil. Thus placed in situations of unwonted responsibility, and at the same time left to their own resources in a much greater degree than any other class of professional men, they are, by the present arrangements, deprived of the society of the educated part of the officers, forced to associate with those whose inferior age and education render them unsuitable and unimproving companions, and deprived of the necessary facilities for uninterrupted study. In these circumstances, your petitioners do not hesitate to convey to your honourable House their fixed conviction, that not only is it impossible for these gentlemen to keep pace with the rapid march of the medical sciences, but it is not even possible for them to retain unimpaired the varied knowledge they had acquired in the schools; and that no system of checks, or of re-examinations, in passing to the higher grades, will compensate for that self-culture, of which, during a long term of years, they are thus deprived.

The Royal College lately received from the Lords Commissioners of the Admiralty, authority to recommend, once in three years, one of their licentiates as a candidate for a navy medical appointment. In 1847, which was the first year after they received this privilege, no candidate presented himself. In 1848, only one such candidate came forward. On both occasions, extensive publicity had been given of the intention of the Royal College to recommend. These facts, together with others well known to them, have satisfied your petitioners that a disinclination exists on the part of their licentiates, and especially of those of them who are distinguished by superior talent and education, to enter the navy medical service; and they cannot doubt that their reluctance proceeds in a great measure from the causes above assigned.

May it therefore please your honourable House to take the premises into your early consideration, and to remedy the evils set forth in this petition, by granting to the Assistant-Surgeons of the Royal Navy the rank and the privileges of ward-room officers.

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